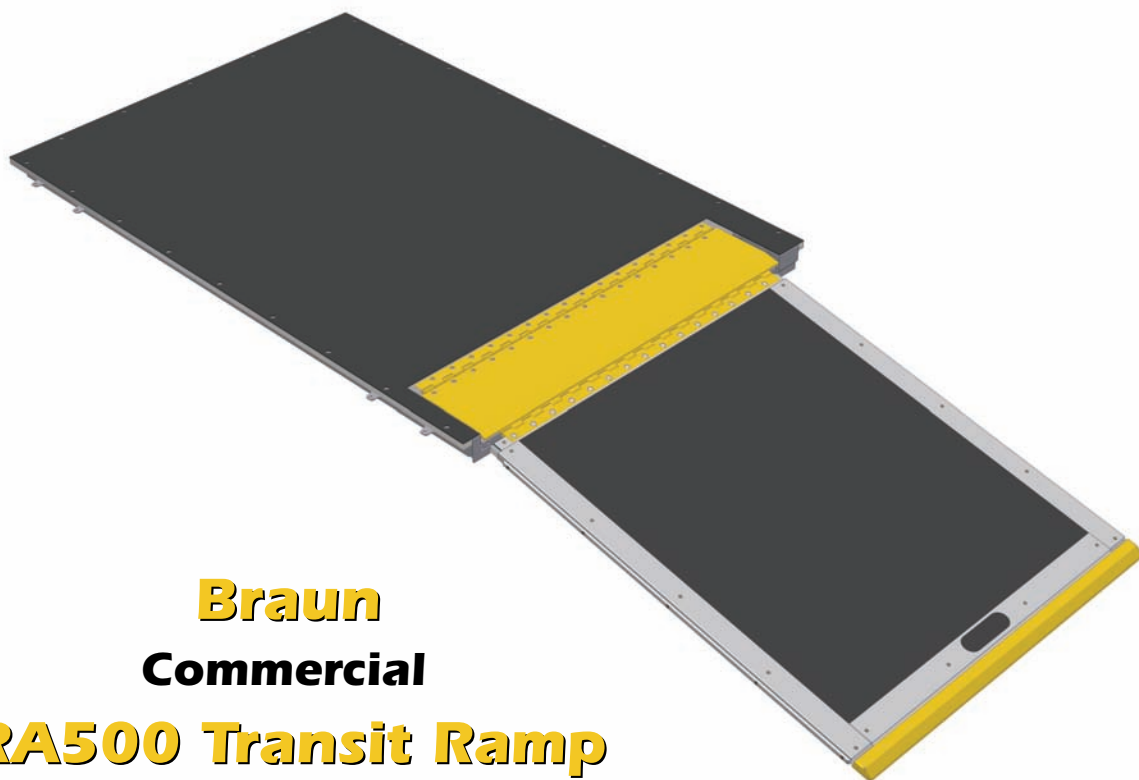


Operator's/Installation/Service Manual



Braun **Commercial** **RA500 Transit Ramp**

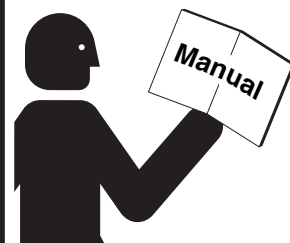
for
Low-Floor Transit Vehicles

 **THE BRAUN**
CORPORATION®
"Providing Access to the World"®

International Corporate Hdqrs: P.O. Box 310 Winamac, IN 46996 USA
1-800-THE LIFT® (574) 946-6153 FAX: (574) 946-4670



! WARNING



Read manual
before operating,
installing or
servicing ramp.
Failure to do so
may result in
serious bodily
injury and/or
property damage.

Congratulations

We at The Braun Corporation wish to express our fullest appreciation on your new purchase.

With you in mind, our skilled craftsmen have designed and assembled the finest ramp available.

This manual includes operating instructions, installation instructions, servicing instructions and instructions for troubleshooting, if needed.

Braun ramps are built for dependability and will provide years of service and mobility independence, as long as the ramp is installed and maintained as specified, and the ramp is operated by an instructed person.

Sincerely,

THE BRAUN CORPORATION

A handwritten signature in black ink, reading "Ralph W. Braun". The signature is fluid and cursive, with the first letters of each word being capitalized and prominent.

Ralph W. Braun
Chief Executive Officer

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RAMP TERMINOLOGY

Ramp Terminology Illustration

Refer to the Figure A below and Figure B on page 3 for identification of components and clarification of direction terminology. Details regarding terminology, direction and components are provided on pages 4 and 5.

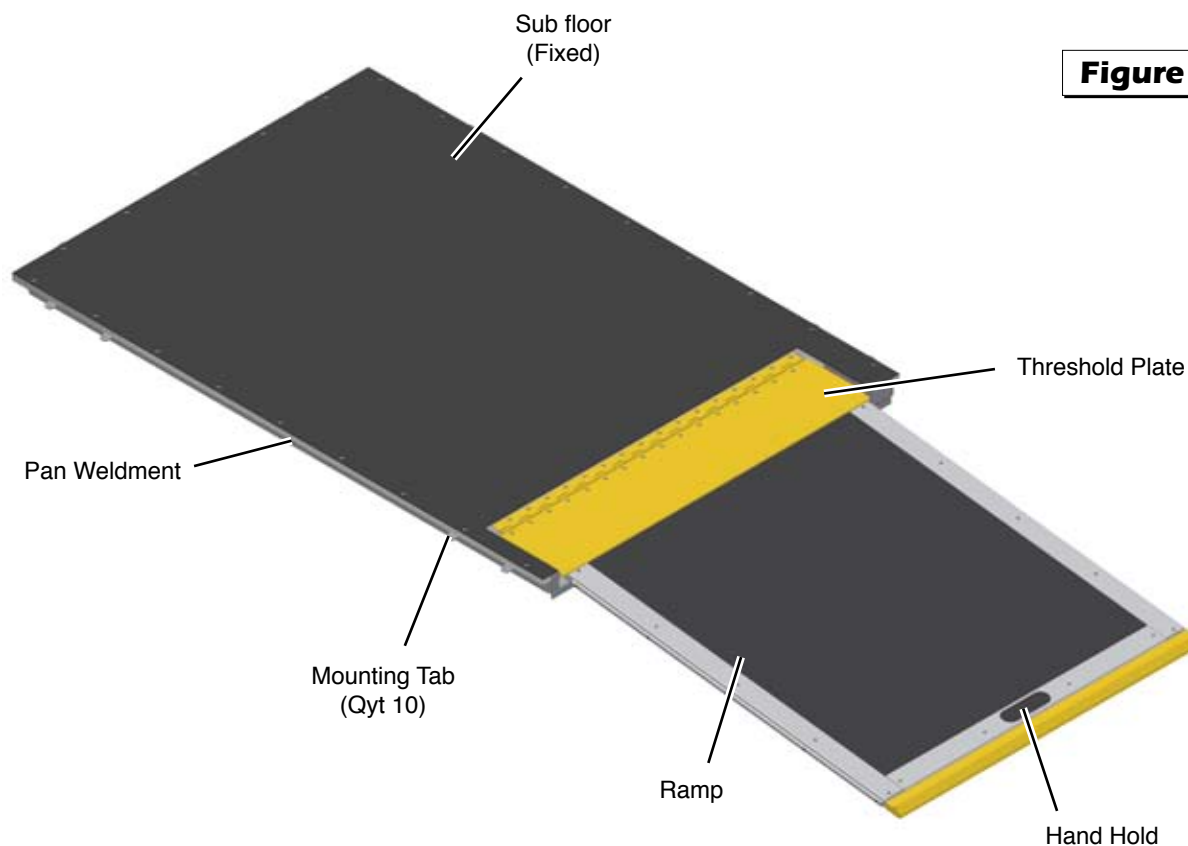
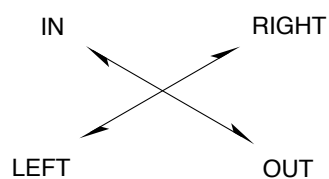


Figure A



As viewed from outside the vehicle

Ramp Components Terminology Illustration

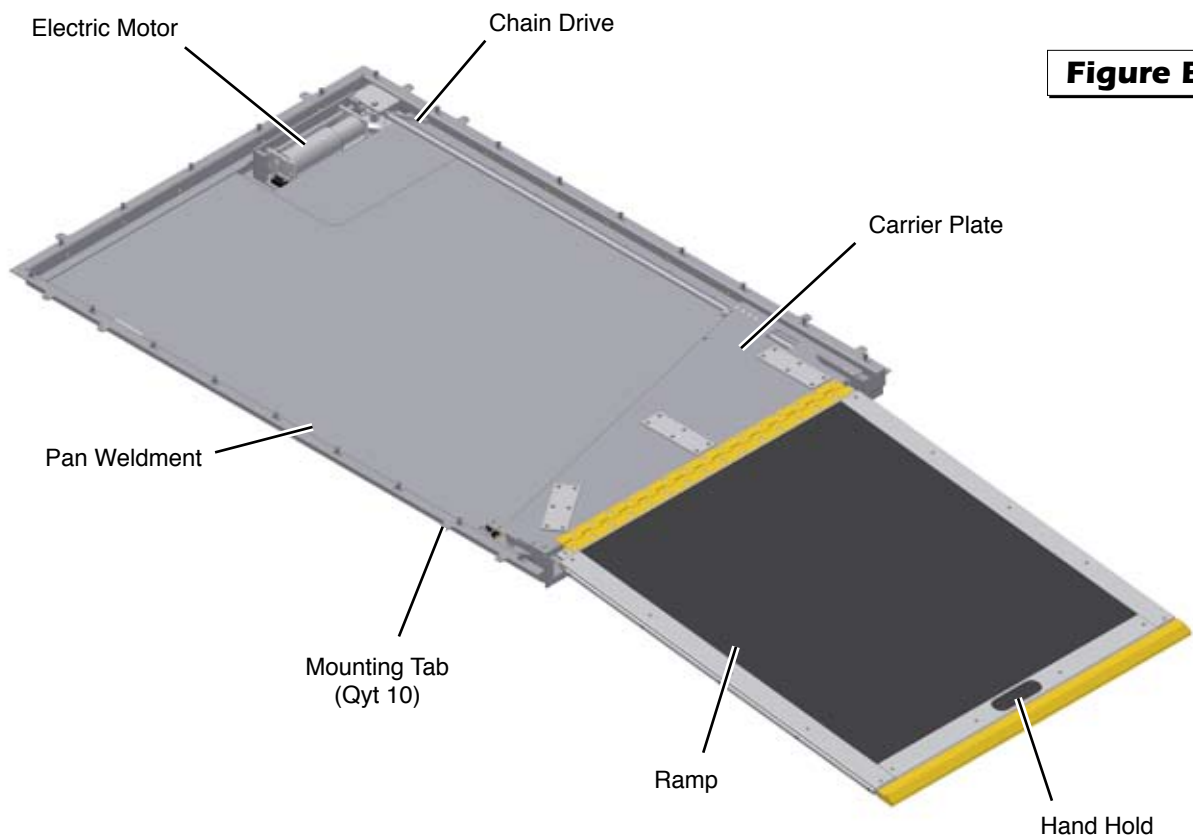
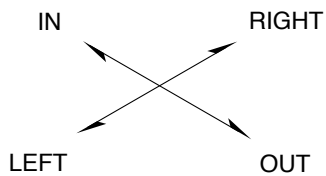


Figure B



As viewed from outside the vehicle

Note: The sub floor and transition threshold plate are removed from this illustration.

RAMP TERMINOLOGY

Introduction

The Braun RA500 In-Floor Ramp (to be referred to as RA500 throughout this manual) is designed for use in low-floor transit vehicles. The RA500 provides vehicle access to people with disabilities (wheelchair passengers or standees using other type mobility aids).

The self-contained “drop-in” electric unit requires no pre-assembly. The electrical components are internal and easily accessible.

The RA500 features a 32” wide ramp in a 38” wide package. A “floor pocket” built into the chassis/floor system allows for simple installation (dimensional requirements specified in the Installation section).

The RA500 is specifically designed to be operated by an attendant. The ramp is controlled by either a “one-touch control” or a “press and hold control”.

The RA500 provides fully automatic operation of ramp functions. The electric system is controlled by a electronic controller board which activates an electric motor in opposite directions for deploy and stow functions (powering a chain drive system).

Obstruction sensing is a standard feature with the RA500 ramp. The RA500 also has an optional weight sensitive pad on the ramp platform. The ramp will not operate with 15 kilograms on the platform when equipped with the weight sensitive pad.

Instructions are provided for manual operation of the ramp in event of power or equipment failure. See **Manual Override** for further details.

Read and become familiar with all operation safety precautions, pre-operation notes and details, operating instructions and manual operating instructions before attempting operation.

Terminology: Become familiar with the terminology that will be used throughout this manual. Become familiar with the identification of RA500 components and their functions. Contact your sales representative or call The Braun Corporation at 1-800-THE LIFT® if any of this information is not fully understood.

Direction: The terms “left”, “right”, “in” and “out” will be used throughout this manual to indicate direction (as viewed from the outside of the vehicle looking directly at the ramp). Refer to the Terminology Illustrations for clarification of direction terms.

Ramp Components

Refer to the Terminology Illustrations on pages 2 and 3.

Control Box (Electronic Controller): The remote mounted control box provides the logic to manage the inputs in order to produce the desired outputs in terms of ramp function and performance. In general terms the control box is commonly referred to as the “controller”.

Pan Weldment (Housing): The pan is the aluminum (casing) mounted in the vehicle floor system which contains the electrical components that power the ramp electrical systems. The fixed sub-floor cover protects the components from above. The cover is easily removed for access to drive components. The sub-floor provides an antiskid surface for entry and exit when the ramp is deployed. The RA500 ramp stows into the sub floor

providing an unobstructed antiskid surface for entry and exit when the ramp is not in use.

Ramp Platform: The ramp platform is the aluminum ramp section assembly featuring a full antiskid surface.

Chain Drive Assembly: The electric motor driven chain drive deploys and stows the ramp platform assembly.

Ramp Actions and Functions

Extend: Extend is the action of the platform moving out of the pan weldment (housing).

Retract: Retract is the action of the platform moving in to the pan weldment (housing).

Deploy: Deploy is the action of the ramp assembly extending to ground level when the DEPLOY (OUT) switch is activated.

Stow: Stow is the action of the ramp assembly retracting inward to the stowed position when the STOW (IN) switch is activated.

Note: the one touch controller activates both the stow and deploy functions, dependant upon the state of the RA500.

Stowed Position: Stowed position is achieved when the ramp platform assembly is fully retracted (resting fully in the pan weldment).

Manual Override: Manual operation is achieved through the use of a mechanical release. Simply pull the release and use the hand hold provided on the ramp platform to manually deploy or stow the ramp. Minimal physical effort is required to stow and deploy the ramp platform. Slow steady motion results in the least resistance and easy operation. See pages 12 and 13 for detailed manual release procedure.

Obstruction Sensing: An obstruction sensing feature is standard with the RA500 ramp. The controller monitors the instantaneous movement of the electric motor, and calculates a “real time” running average of the current. It then compares the programmed peak (maximum vs. instantaneous) and delta (instantaneous minus running average) limits to determine if an obstruction has been encountered.

Weight Sensing Pad (optional): The platform can be equipped with a weight sensing pad. This optional feature will cause the ramp not to operate in the event that 15 kilograms or more is on the ramp platform.

RAMP OPERATION

Safety Symbols

SAFETY FIRST! Know That....

A All information contained in this manual and supplements (if included), is provided for your safety. Familiarity with proper operation instructions as well as proper maintenance procedures are necessary to ensure safe, trouble free operation. Safety precautions are provided to identify potentially hazardous situations and provide instruction on how to avoid them.

B

⚠ WARNING

This symbol indicates important safety information regarding a potentially hazardous situation that could result in serious bodily injury and/or property damage.

C

⚠ CAUTION

This symbol indicates important information regarding how to avoid a hazardous situation that could result in minor personal injury or property damage.

D **Note:** Additional information provided to help clarify or detail a specific subject.

These symbols will appear throughout this manual. **Recognize the seriousness of this information.**

Ramp Operation Safety Precautions

⚠ WARNING

If the ramp operating instructions, manual operating instructions and/or ramp operation safety precautions are not fully understood, contact The Braun Corporation immediately. Failure to do so may result in serious bodily injury and/or property damage.

⚠ WARNING

Read manual and supplement(s) before operating ramp. Read and become familiar with all safety precautions, pre-operation notes and details, operating instructions and manual operating instructions before operating the ramp. **Note:** All transit agency personnel (drivers and ramp attendants) must read and become familiar with the contents of this manual and supplement(s) before operation.

⚠ WARNING

Load and unload on level surface only.

⚠ WARNING

Engage vehicle parking brake before operating ramp.

⚠ WARNING

Provide adequate clearance outside the vehicle to accommodate the ramp before opening ramp door(s) or operating ramp.

⚠ WARNING

Inspect ramp before operation. Do not operate ramp if you suspect ramp damage, wear or any abnormal condition.

⚠ WARNING

Keep operator and bystanders clear of area in which the ramp operates.

⚠ WARNING

Load and unload clear of vehicular traffic.

⚠ WARNING

Open ramp door(s) fully and secure before operating ramp.

⚠ WARNING

Do not overload or abuse. The rated capacity is 300 kilograms (660 pounds).

Ramp Operation Safety Precautions (continued)

- ⚠ WARNING** Do not activate control switch(es) when anyone is near the area in which ramp operates.
- ⚠ WARNING** It is the responsibility of the attendant to oversee and assist ramp passengers.
- ⚠ WARNING** Attendants must never operate the vehicle, the ramp or attend to passengers if intoxicated.
- ⚠ WARNING** Intoxicated passengers should not be allowed to board the vehicle.
- ⚠ WARNING** Wheelchair passengers must position and secure (buckle, engage, fasten, etc.) the wheelchair-equipped occupant seat belt before loading onto the ramp.
- ⚠ WARNING** Be aware of the ramp slope (angle).
- ⚠ WARNING** Wheelchair passengers should not raise front wheelchair wheels (pull wheelie) when on the ramp.
- ⚠ WARNING** The wheelchair must be positioned in the center of the ramp when loading and unloading.
- ⚠ WARNING** Keep ramp owner's manual in ramp-mounted vehicle at all times.
- ⚠ WARNING** Maintenance and lubrication procedures must be performed as specified in this manual by authorized (certified) service personnel.
- ⚠ WARNING** Never modify (alter) a Braun Corporation ramp.
- ⚠ WARNING** Do not use accessory devices not authorized by The Braun Corporation.
- ⚠ WARNING** Do not remove any guards or covers.
- ⚠ WARNING** If the information contained in this manual is not fully understood, contact The Braun Corporation immediately.
- ⚠ WARNING** Failure to follow these safety precautions may result in serious bodily injury and/or property damage.

RAMP OPERATION

Operation Notes and Details

The RA500 ramp provides vehicle access to people with disabilities (wheelchair passengers or standees using other type mobility aids). The commercial oriented RA500 ramp is operated by the transit vehicle driver/attendant. Unless your transit agency has a published policy stating that driver/attendants do not aid ramp passengers, **safe entering and**

exiting of ramp passengers is the responsibility of the driver/attendant.

As stated in the Ramp Operation Safety section, all information in this manual is provided for the safety of passengers, attendants and bystanders. **Recognize the seriousness of this information.**

Read and become familiar with all ramp operation safety precautions, pre-operation notes and details, operating instructions and manual operating instructions before attempting ramp operation procedures or assisting ramp passengers boarding and exiting the vehicle.

Ramp Access Doors and Interlocks

Attendants must become familiar with the vehicle ramp access door system and interlock(s), as well as the proper operation of the ramp.

Vehicle ramp access door configurations and operation procedures vary. Ensure the ramp door is fully open before activating the ramp (an interlock typically prevents ramp operation unless the door is fully open). Attendants and passengers must keep clear of the area in which the power door operates. Ensure the path is clear before closing the door. Be sure the door is fully closed before attempting to drive the vehicle (interlocks typically ensure this).

Interlocks are required by nearly all transit authorities. Vehicle interlocks typically prevent vehicle motion if the ramp is not stowed. In some cases, the ramp cannot be operated if interlock conditions are not met. Interlock requirements may include: the vehicle transmission must be engaged in Park, the parking brake must be engaged, the ramp access door must be fully open and/or others. Multiple interlocks may exist.

Instructions for operation of interlocks and door systems cannot be addressed in this manual due to the variety of procedures required for operating them.

General instructions for safe operation of the ramp are provided. Ramp safety and ramp passenger safety information is included. **It is the responsibility of the attendant** to properly open and close the ramp access door(s), to activate interlock(s), to properly activate the ramp power functions as well as assist ramp passengers.

Do not operate the ramp if you suspect ramp damage, wear or any abnormal condition. Discontinue use immediately and contact The Braun Corporation at 1-800-THE LIFT®. One of our national Product Support representatives will direct you to an authorized service technician who will inspect the ramp.

Operation Procedure Review

The Braun Corporation recommends that transit agency supervisors and driver/attendants review the safety precautions and operation procedures appearing in this manual with the ramp sales representative (or vehicle converter) **before** attempting ramp operation.

Any questions or concerns can be answered at that time. Operate the ramp through all functions to ensure the proper use and operation is understood.

Transit agency supervisors should train and educate all driver/attendants on the proper use and operation of the vehicle, door system, interlock(s), ramp and ramp passenger safety.

The ramp owner's/service **manual must be stored in the ramp-equipped vehicle at all times.**

WARNING

Read and become familiar with all ramp operation safety precautions, pre-operation notes and details, operating instructions and manual operating instructions prior to operating the ramp. If this information is not fully understood, contact The Braun Corporation immediately. Failure to do so may result in serious bodily injury and/or property damage.

Preventive Maintenance:

Maintenance is necessary to ensure safe and trouble free operation. General preventive maintenance consisting of **careful** inspections and cleaning the ramp system should be a part of your transit agency's daily service program. Simple inspections can detect potential operational problems.

Regular preventive maintenance will reduce potential operation downtime and increase the service life of the ramp, as well as possibly detecting potential hazards.

A generic **Daily Preventive Maintenance Schedule** is provided in this manual for your transit agency's use. The form can be tailored to your particular application.

Exposure to harsh weather, environmental conditions, or heavy usage may require more frequent maintenance and lubrication procedures.

Preventive maintenance visual inspections **do not** take the place of the procedures specified in the Maintenance and Lubrication Schedule provided in this manual. Refer to the Maintenance and Lubrication section in this manual for further details.

RAMP OPERATION

Ramp Power Operation

Ramp Operating Instructions address the required controller inputs and the corresponding ramp functions. Instructions for customer specific display panels and interlock options will not be addressed due to the boundless variations in application and installation of the ramp. Manual Operating Instructions are addressed in the event of power or equipment failure.

Before Operating Ramp: Always park the vehicle on a level area, away from vehicle traffic. Place the vehicle transmission in “Park” and engage the park or emergency brake.

Customer Interlock: The ramp controller requires either a ground (-) or (+) signal be supplied, one of these signals is required but not both. This signal interlocks the ramp functions. If this interlock signal is not present, the controller will not provide any outputs necessary to operate the ramp. If the interlock signal is lost during ramp operation, the platform assembly will stop, and the controller will not function any further until the interlock signal is present once again.

Operator Input Switches: The RA500 Ramp electronic controller provides fully automatic operation of all ramp functions. Ramp functions can be performed from any position the platform assembly happens to be in at the time the operator input switch is activated. The ramp is protected by a standard obstruction sensing feature.

One-Touch Operation: In one-touch mode, the ramp will deploy if fully stowed. If the ramp is in any other position the ramp will stow. The ramp function will continue until the switch is pressed again (indicating stop immediately), the unit reaches the end of travel, or a “halt condition” occurs (see Halt Conditions).

Two-Way Toggle Operation: In two-way toggle mode, there are separate switches for deploy and stow functions. One of the switches must be pressed and held or locked into position (continuous input signal required) for the RA500 ramp to operate. The ramp will move in the selected direction until the switch is released (signal interrupted), the unit reaches the end of the travel, or a “halt condition” occurs (details follow).

Halt Conditions: Several conditions can cause a normal sequence to terminate (stop):

- Obstructions (details below)
- Customer Interlock signal lost (see Customer Interlock)
- Optional platform weight sensing pad senses a load equal to or greater than 15 kilograms (details below)
- End of travel reached

Obstructions: The controller performs obstruction sensing (see RA500 ramp Terminology: Obstruction Sensing) on all stow and deploy movements of the ramp. The selected obstruction response mode configured in the controller during installation, either immediately stops the present movement when obstructed, or stops and then reverses movement for 1 second. Once an obstruction has halted the ramp, the controller automatically resets and awaits operator input for further operation.

Weight Sensing Pad (optional): The platform can be equipped with a weight sensing pad. This optional feature will cause the ramp not to operate in the event that 15 kilograms or more is on the ramp platform.

RAMP OPERATION

Power Ramp Safety

Be certain there is adequate clearance outside the vehicle before deploying the power ramp.

The ramp operator (attendant) and bystanders must keep clear of the area in which the ramp operates and clear of all moving parts. Attendants must ensure that passengers keep clear of the area in which the ramp operates. Do not attempt to grip or hold the ramp.

If you are an attendant operating the ramp, it is your responsibility to oversee and/or assist in

performing safe passenger loading and unloading procedures. Observe your passengers at all times when they are entering and exiting the vehicle. Attendants must be aware of any special needs and/or procedures required for safe transport of wheelchair passengers.

Do not attempt to load or unload a passenger in a wheelchair or other apparatus that does not fit on the ramp. Do not exceed the 300 kilograms (660 pound) load capacity of the ramp. Passengers should enter and exit one at

a time. The attendant should not board the ramp with the passenger except when assistance is required and the load capacity is not exceeded. Always return the ramp to the stowed position when not in use.

⚠ WARNING

Provide adequate clearance outside of vehicle to accommodate ramp. Failure to do so may result in serious bodily injury and/or property damage.



⚠ CAUTION

Allow ramp to deploy fully before boarding. Failure to do so may result in damage.

RAMP OPERATION

Ramp Manual Operation

If you experience power or equipment failure, the ramp can be manually stowed and deployed. The RA500 must be manually operated by an attendant.

The RA500 is equipped with a cable-activated manual release system and a oval-shaped hand hold slot in the platform for manual operation (see Figure C and E).

The safety precautions addressed in the Ramp Power Operation section apply to manual operation of the ramp also. **Read and become familiar with all ramp safety precautions.**

Cable-Activated Manual Release System: A cable activated manual release system disengag-

es (unlocks) the ramp platform assembly drive chain to allow the platform to be manually extended or retracted as required. A T-handle is provided on the release cable for activation of the manual release system (details follow).

After manually extending or retracting the platform assembly, it is extremely important that the cable-activated manual release is positively re-engaged to secure (lock) the platform assembly before loading a passenger or continuing vehicle use (details provided). **Failure to re-engage and secure the platform may result in unintended ramp movement, which may result in serious bodily injury and/or property damage.**

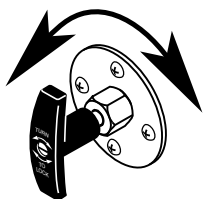


To Manually Extend or Retract Ramp:

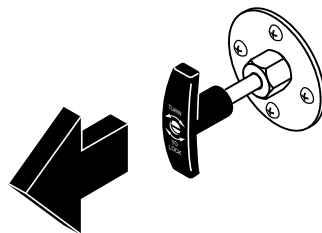
1. Turn (loosen) the manual release "T" handle 90°.
2. Pull the "T" handle fully outward (3" to 4").
3. Turn (tighten) the "T" handle 90° to secure handle in the disengaged (unlocked) position.
4. Verify mechanism is disengaged (unlocked).
5. Carefully move the platform in or out to desired location using the platform Hand Hold (see Figure E).

Note: Minimal physical effort is required to manually operate the ramp. Slow steady motion results in the least resistance and easy operation. The faster you attempt to manually operate the ramp, the greater the resistance.

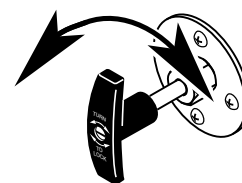
Figure C



Step 1



Step 2



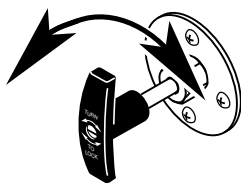
Step 3

Ramp Manual Operation (continued)

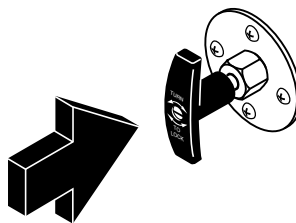
To Reengage Carriage Assembly to Drive Chain:

1. Position the ramp platform manually so that only 15 cm is extended out of the cassette.
2. Turn (loosen) the manual release "T" handle 90°.
3. Push the "T" handle fully inward until handle contacts shaft shoulder (3" to 4").
4. Grasp the platform Hand Hold and move the platform slightly outward until **platform locks** into position (secured by re-engaging the carriage assembly with the drive chain).
5. Turn (tighten) the "T" handle 90° to secure handle in the engaged (locked) position.
6. Verify mechanism is reengaged (locked). Pull on the Hand Hold to ensure no movement occurs.
7. Stow the remaining portion of the platform by using the electrical system.

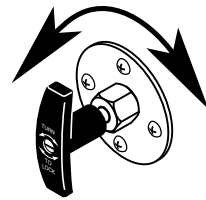
Figure D



Step 2

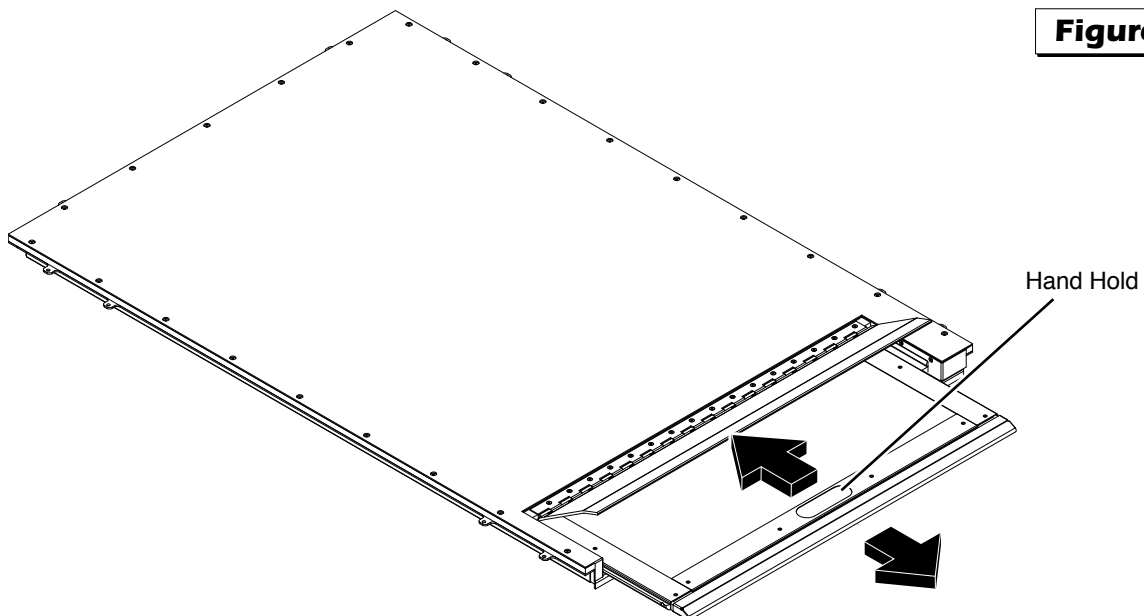


Step 3



Step 5

Figure E



RAMP OPERATION

Ramp Passenger Safety

Unless your transit agency has a published policy stating that driver/attendants do not aid ramp (disabled) passengers, **it is the responsibility of the driver/attendant to ensure that ramp passengers enter and exit the vehicle on the ramp in the safest manner.**

ADA requirements state that transit drivers/attendants **must** assist with attaching and removing wheelchair and occupant restraint belts.

Ramp passengers (wheelchair passengers and standees), and attendants must use common sense and good judgment regarding ramp safety. Each wheelchair passenger (or standee) has a unique set of physical abilities combined with the physical characteristics of his or her wheelchair (or other mobility aid) that dictate the method in which he or she will enter and exit the vehicle.

Wheelchair attendants should be instructed on any special needs and/or procedures required for safe transport of wheelchair passengers. Follow all safety instructions regarding torso restraints,

stability, balance, weight distribution and use of attendants as specified in the owner's manual supplied with the passenger's wheelchair (or other mobility aid). Wheelchair passengers must determine, establish and practice ramp boarding and exiting procedures under the direction of the their personal health care professional and wheelchair representative. Those procedures should be conveyed to the ramp attendant. Know your passengers abilities and needs for **optimum safety**.

Attendants must never operate the vehicle, the ramp or assist passengers if intoxicated. Intoxicated passengers should not be allowed to board or exit the vehicle.

Passengers should be positioned in the center of the ramp at all times. Attendants and ramp passengers must be able to clearly view the ramp whenever boarding and exiting the vehicle. Observe your passengers at all times when they are entering and exiting the vehicle.

Wheelchair-Equipped Occupant Seat Belts: Wheelchair passengers should position and buckle their wheelchair-equipped seat belt (torso restraint), as specified by the manufacturer, **before** loading onto a wheelchair ramp.

Different types of disabilities require different types of wheelchairs and different types of wheelchair-equipped occupant restraint belt systems (torso restraint). It is the responsibility of the wheelchair passenger to have his or her wheelchair equipped with an occupant restraint (seat belt) under the direction of their health care professional.

Stabilizing Wheelchairs: Powered and manual wheelchairs are designed to remain upright and stable during normal operation. All activities which involve movement in a wheelchair have an effect on the combined center of gravity of the occupant and wheelchair. Be aware of the ramp slope (angle). The slope of the ramp has a direct effect on the center of gravity. The wheelchair passenger's center of gravity and their ability to maintain stability and balance must be kept in mind by the wheelchair passenger and the attendant.

The aid of an attendant stabilizing the wheelchair is recommended for **optimum safety**. Wheelchair passengers who are unable to maintain stability and balance should not board a ramp without assistance. Counterbalance devices (anti-tippers) may be available from the wheelchair representative to enhance stability and balance.

WARNING

Position and fasten the wheelchair-equipped occupant seat belt before loading onto the wheelchair ramp. Failure to do so may result in serious bodily injury and/or property damage.



Ramp Passenger Safety

Wheelchairs should be operated at a slow and constant speed when on the ramp. Wheelchairs should not accelerate suddenly when on the ramp. Wheelchair passengers should not raise the front wheelchair wheels (pull wheelie) when on the ramp.

Wheelchair passengers who intend to enter and exit the vehicle without the assistance of an attendant must determine the safest and most practical method and orientation of entering and exiting based on the physical characteristics of their personal wheelchair and his or her physical capabilities to maintain stability while the wheelchair is in motion on the ramp.

Wheelchair Attendants: When assisting a wheelchair occupant, remember to use good body mechanics. When the wheelchair is on the ramp, the attendant must grasp the push handles (or other) securely. Detachable wheelchair parts such as arms or leg rests must never be used for hand holds or lifting supports. Doing so could result in the parts being inadvertently detached from the wheelchair **resulting in possible injury to the wheelchair occupant and/or the attendant.**

RAMP INSTALLATION

Safety Symbols

SAFETY FIRST! Know That....

A All information contained in this manual and supplements (if included), is provided for your safety. Familiarity with proper operation instructions as well as proper maintenance procedures are necessary to ensure safe, trouble free operation. Safety precautions are provided to identify potentially hazardous situations and provide instruction on how to avoid them.

B

⚠ WARNING

This symbol indicates important safety information regarding a potentially hazardous situation that could result in serious bodily injury and/or property damage.

C

⚠ CAUTION

This symbol indicates important information regarding how to avoid a hazardous situation that could result in minor personal injury or property damage.

D **Note:** Additional information provided to help clarify or detail a specific subject.

These symbols will appear throughout this manual. **Recognize the seriousness of this information.**

Installation / Service Safety Precautions

⚠ WARNING

If installation, maintenance or repair procedures cannot be completed exactly as provided in this manual or if the instructions are not fully understood, contact The Braun Corporation immediately. Failure to do so may result in serious bodily injury and/or property damage.

⚠ WARNING Read this manual and supplement(s) before performing installation, operation or service procedures.

⚠ CAUTION Installation specifications and dimensions must be met.

⚠ WARNING Remove any obstructions within the ramp mounting/operating area prior to beginning installation procedures.

⚠ WARNING Do not operate ramp prior to positive securement of the pan.

⚠ WARNING Check for obstructions such as gas lines, wires, exhaust, etc. before drilling or cutting during installation procedures.

⚠ WARNING Route all cables clear of exhaust system, other hot areas, moving parts, wet areas, etc.

⚠ WARNING Risk of electrical shock or fire! Use extra care when making electrical connections. Connect and secure as outlined in Installation Instructions and Wiring Diagrams.

⚠ WARNING Maintenance and repairs must be performed only by authorized service personnel.

⚠ WARNING Perform maintenance and lubrication procedures exactly as outlined in the Maintenance and Lubrication Schedule contained in this manual. Disconnect the power cable at the battery prior to servicing.

⚠ WARNING Keep hands, arms and all other body parts clear of moving parts.

Installation / Service Safety Precautions

- ⚠ WARNING** Never modify (alter) a Braun Corporation ramp.
- ⚠ WARNING** Replacement parts must be Braun authorized replacements.
- ⚠ WARNING** Never install screws or fasteners (other than factory equipped).
- ⚠ WARNING** Failure to follow these safety precautions may result in serious bodily injury and/or property damage.

RAMP INSTALLATION

Installation Requirements

Braun RA500 Ramp must be installed and serviced by a Braun authorized service representative who has attended and been certified by The Braun Corporation Sales and Service School for Braun Mobility Products.

Read and become familiar with the operating instructions and the installation instructions contained in this manual before beginning installation, operation or service procedures.

WARNING

Read this manual before performing installation, operation or service procedures. Failure to do so may result in serious bodily injury and/or property damage.

Chassis Requirements

The Braun RA500 Ramp is designed for use in low-floor transit vehicles. A “floor pocket” (mounting hole) built into the chassis/floor system allows for simple installation (accepts “drop-in” unit). The **Floor Pocket Clear Opening Dimensions** on the following pages.

An optional RA500 model without the fixed sub floor is available. When installing this model the vehicle floor is installed above the ramp assembly. This model is designed to be installed above the frame, but below the vehicle floor. This model does not have the fixed sub floor on top of the assembly.

The ramp installer must provide an appropriate framework in the applicable location in the vehicle (aligned center with passenger door opening). Ramp assembly mounting hardware and/or bracketry are directly dependant upon the vehicle chassis and “floor pocket” configuration (not supplied).

Outboard Support Tube: An outboard support tube must be positioned under the outboard edge of the opening (minimum 40mm x 50mm steel tube). See Figure F. The recommended maximum height of the support tube is 210mm above ground level.

Kneeling Vehicles: 210mm is the maximum dimension measured with suspension lowered.

EU: Installations with the support tube positioned higher than 210mm above ground level may not comply with EU ramp slope requirements.

Some OEM chassis meet these specifications. The RA500 ramp was designed to conform to these specifications.

The ramp pan horizontal border (lip) sets on the floor pocket perimeter (framework, sub floor, etc.). The finished flooring can be cut to conform to the border of the pan for a flush transition surface from ramp-to-floor. The finished flooring can also go over the top of the ramp if the optional ramp model without the fixed sub floor is installed.

Door Opening: Open the door(s) **fully** and check the clear door opening width dimension. **Specified minimum clear door opening width must be provided** (850mm for 825mm ramp).

Door(s) must open outward. When closed, the door(s) should align with and conform to the outboard edge of the ramp pan (rubber seal on bottom of door).

Minimum Clear Door Opening Dimensions are defined as finished door opening, including any intrusive door jambs, headers, sills or hinges.

Obstructions: Any intrusive obstructions within the door opening or the ramp mounting/operating area (such as seats, molding, lights, brackets, etc.) **must be removed**. Trim or molding that creates an uneven mounting surface should be removed.

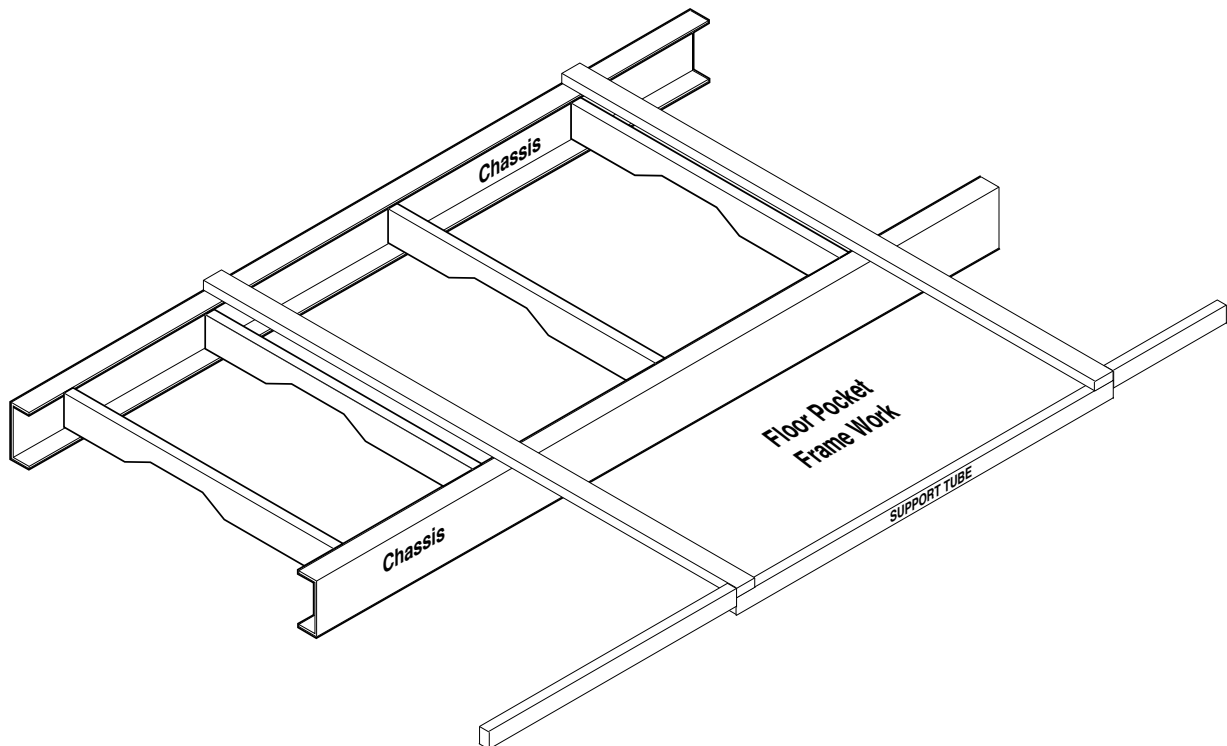
RAMP INSTALLATION

Ramp Support Structure

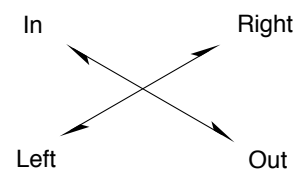
Outboard Support Tube: Recommended Maximum Height: 210mm above ground level. **Kneeling Vehicles** (measured with suspension lowered).

EU: Installations with support tube positioned higher than 210mm above ground level **may not comply with EU** ramp slope requirements.

Figure F



Structure: Minimum 40mm x 50mm steel tubing (or equivalent).

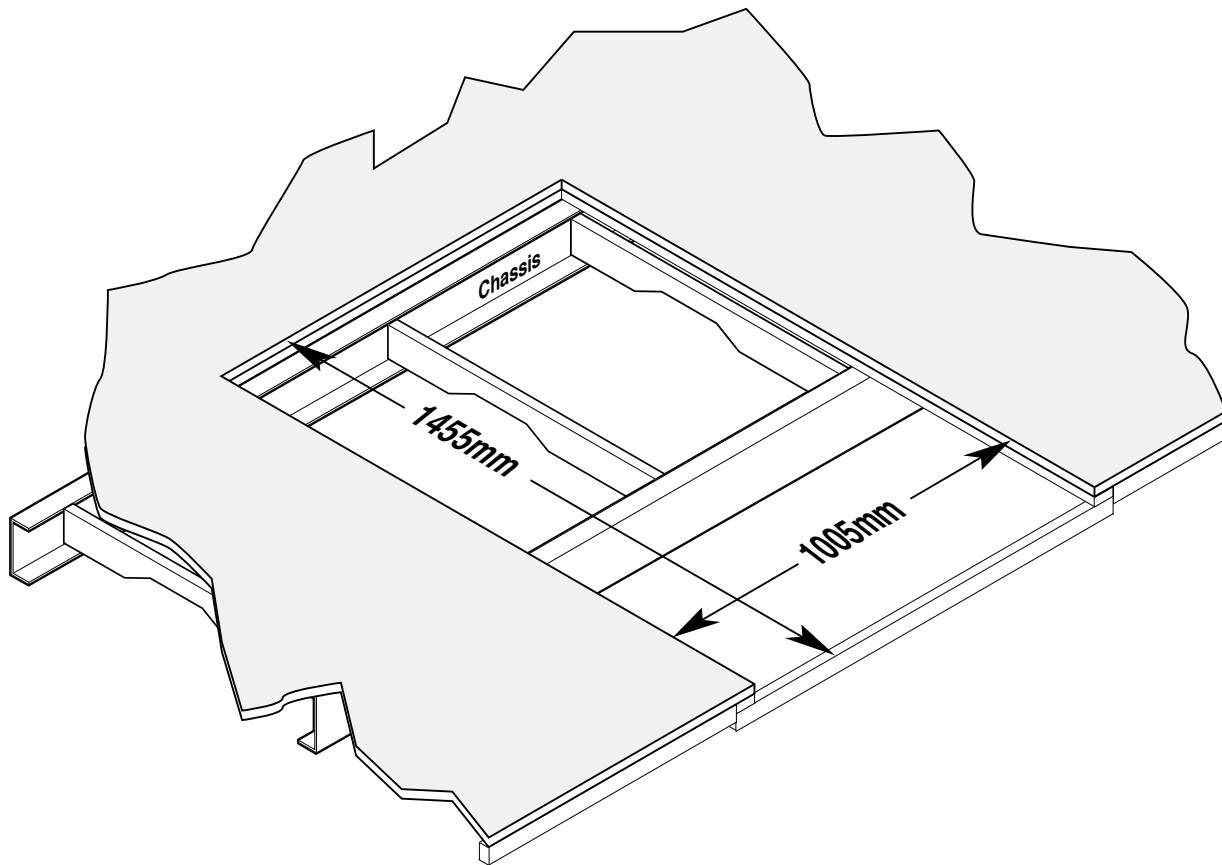


As viewed from outside the vehicle

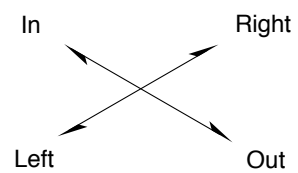
RAMP INSTALLATION

"Floor Pocket" Clear Opening Dimensions

Figure G



The ramp must be supported by a minimum of three chassis members.

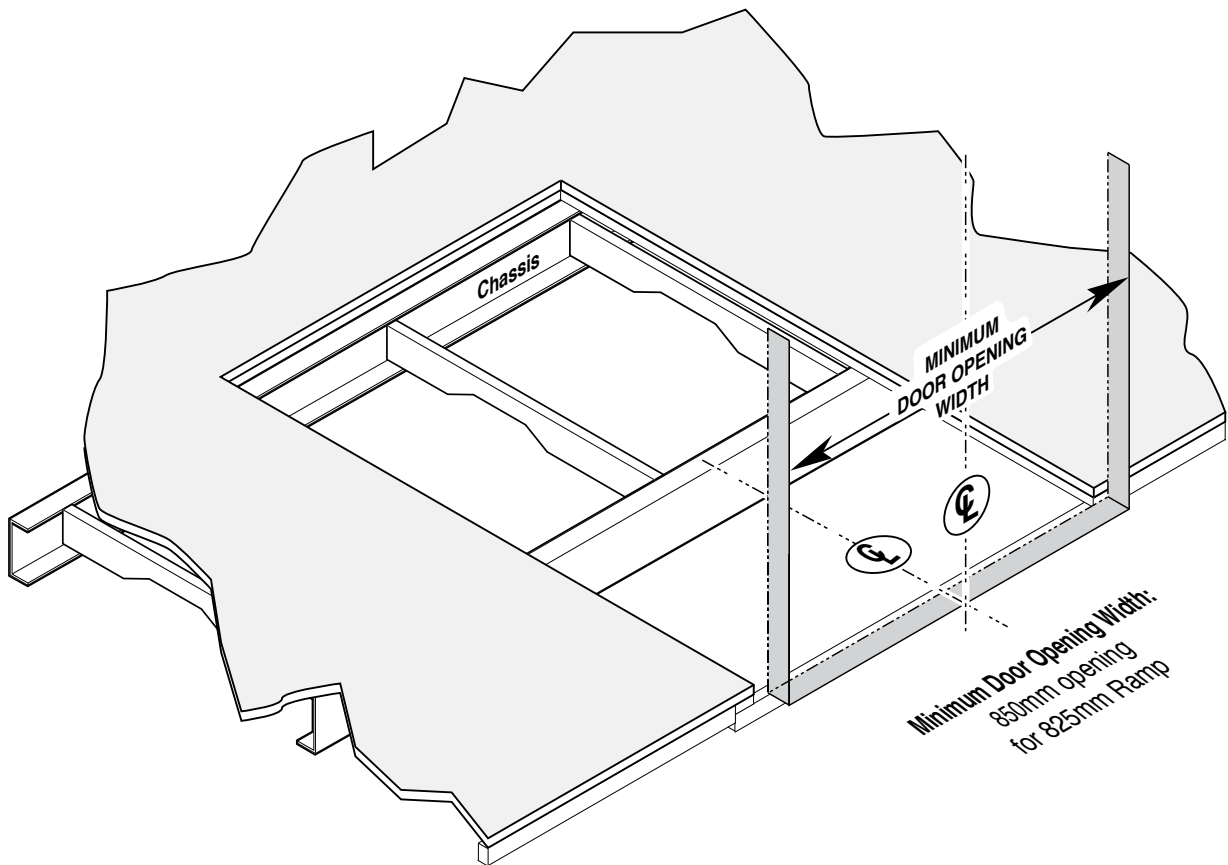


As viewed from outside the vehicle

RAMP INSTALLATION

Clear Door Opening Width Dimension

Figure H



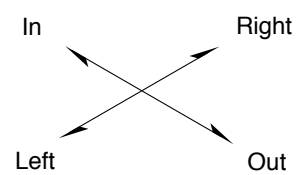
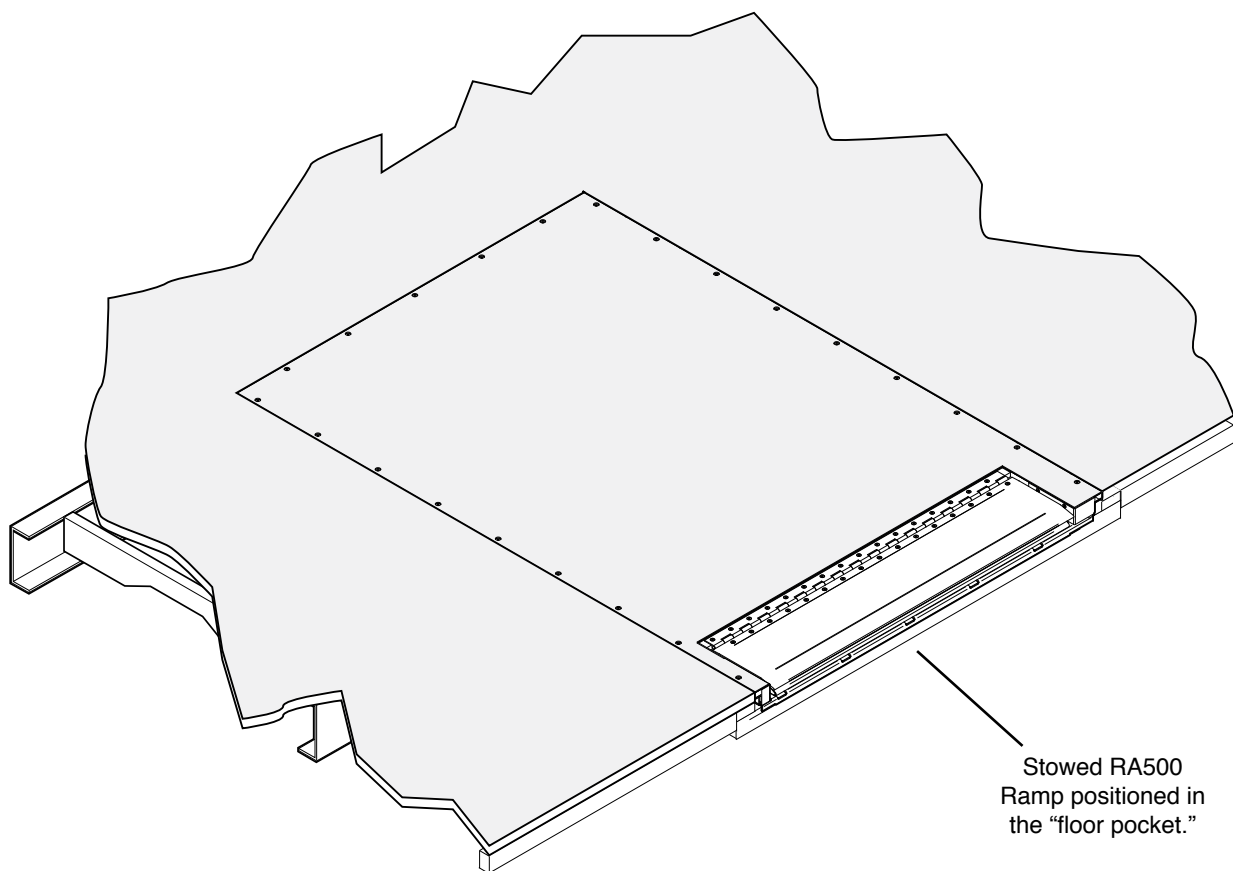
The ramp platform **must be aligned** with the **center** of the door opening.

Door(s) **must** open outward.

RAMP INSTALLATION

Installed Ramp - Stowed

Figure J



As viewed from outside the vehicle

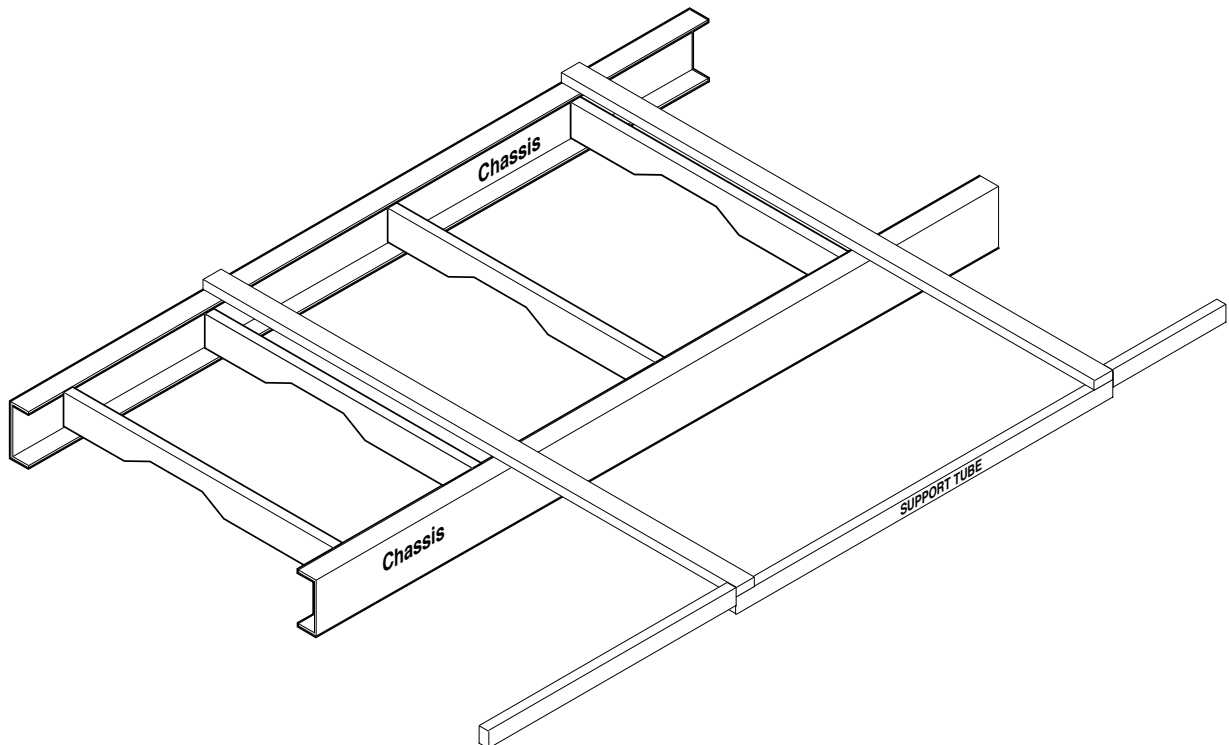
RAMP INSTALLATION

Ramp Support Structure for RA500 w/o Fixed Sub floor

Outboard Support Tube: Recommended Maximum Height: 210mm above ground level. **Kneeling Vehicles** (measured with suspension lowered).

EU: Installations with support tube positioned higher than 210mm above ground level **may not comply with EU** ramp slope requirements.

Figure K

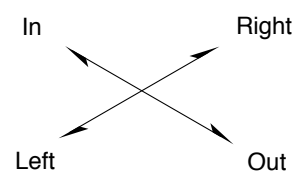
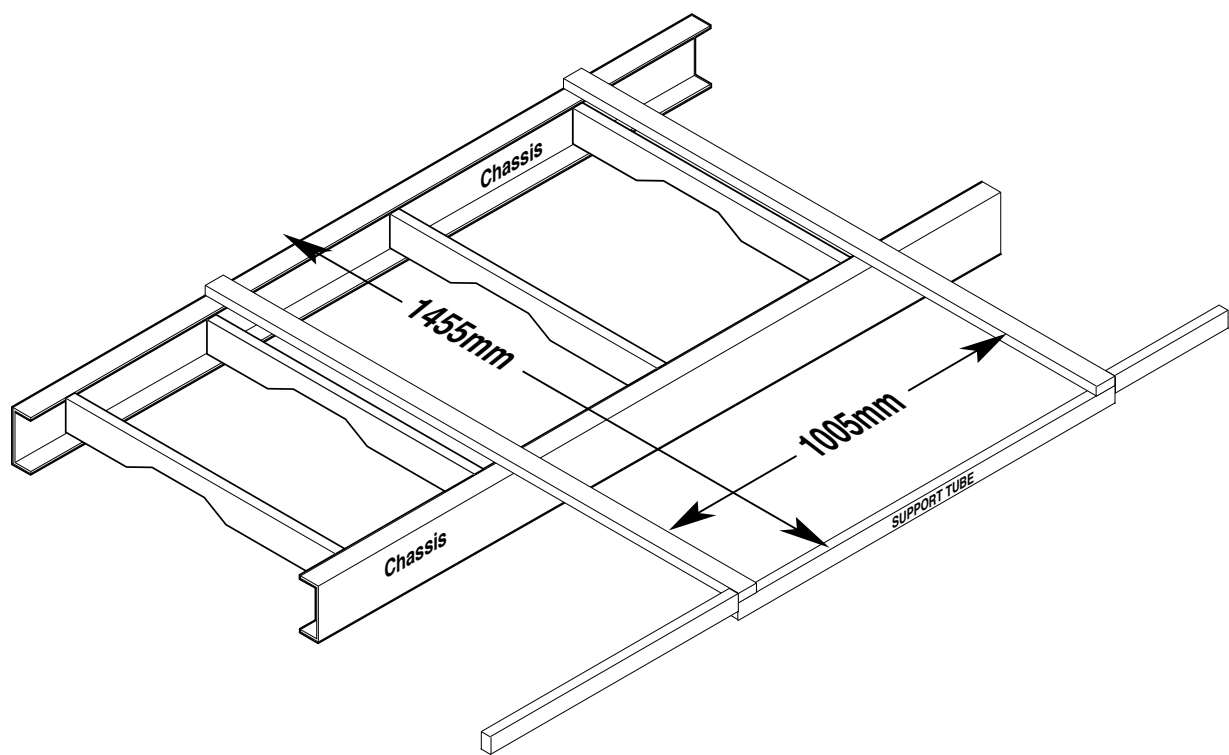


Structure: Minimum 40mm x 50mm steel tubing (or equivalent).

RAMP INSTALLATION

"Floor Pocket" Clear Opening Dimensions for RA500 w/o Fixed Sub floor

Figure L

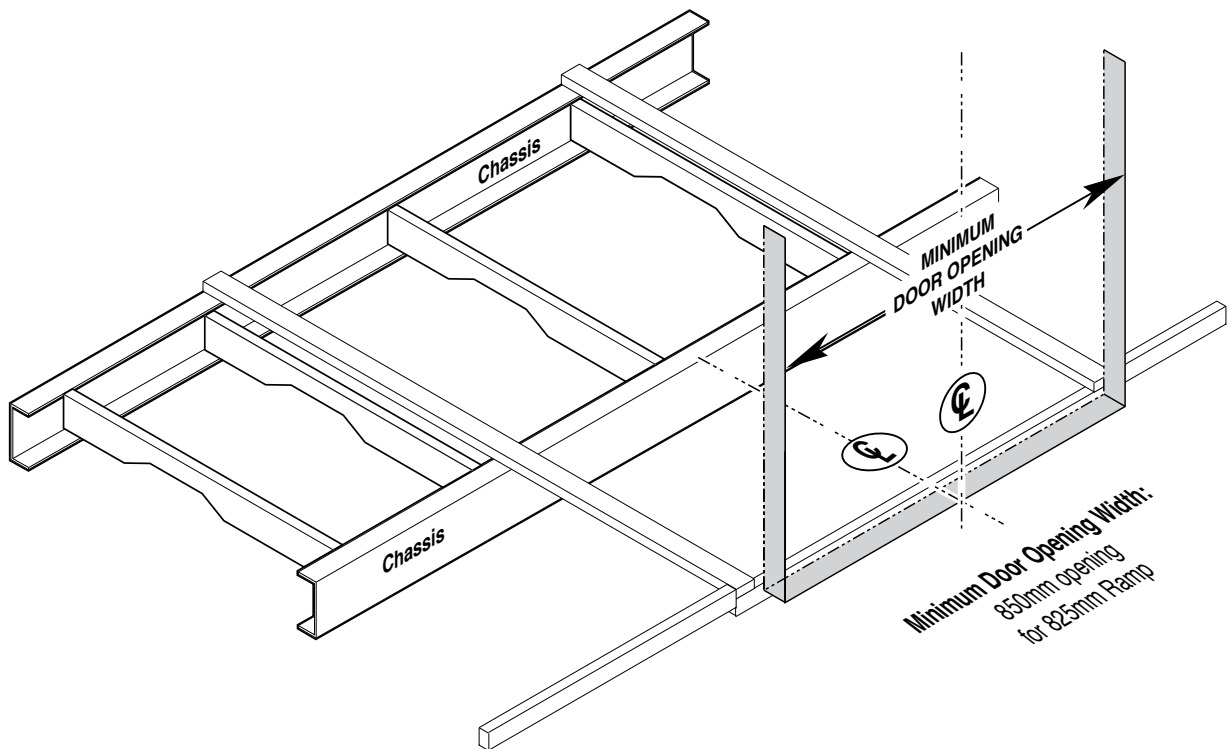


As viewed from outside the vehicle

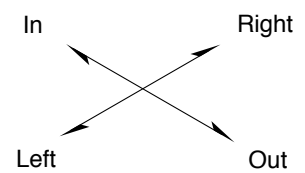
RAMP INSTALLATION

Clear Door Opening Width Dimension for RA500 w/o Fixed Sub floor

Figure M



The movable ramp platform **must be aligned** with the **center** of the door opening.

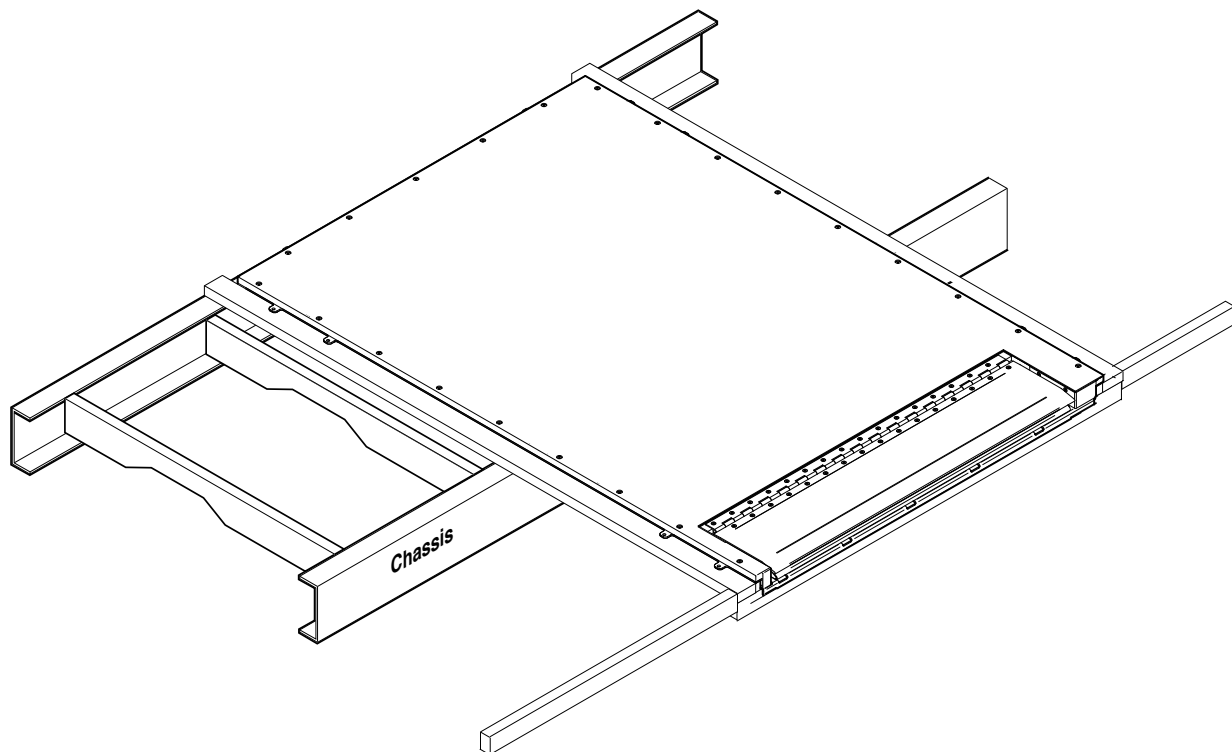


As viewed from outside the vehicle

RAMP INSTALLATION

Installed Ramp - Stowed RA500 w/o Fixed Sub floor

Figure N



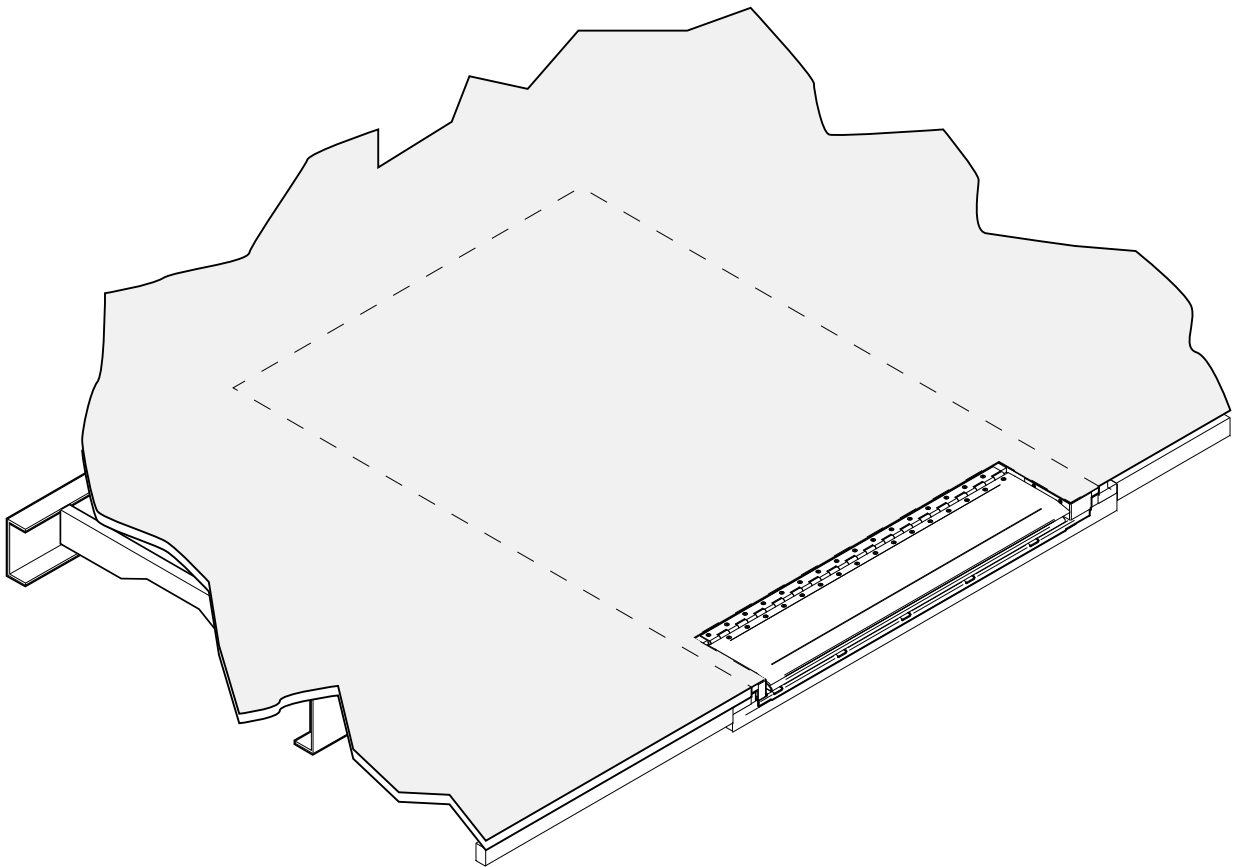
The movable ramp platform **must be aligned** with the **center** of the door opening.

Door(s) **must open outward.**

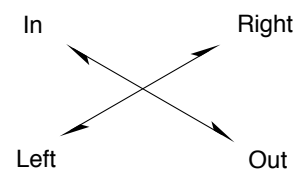
RAMP INSTALLATION

Installed Ramp - Stowed with Vehicle Floor Installed over Ramp

Figure P



Floor should support
upper surface of the
ramp.



As viewed from outside the vehicle

RAMP INSTALLATION

Electrical Connections

The ramp installer provides an appropriate control switch for the end user. One-touch operation using a single "operate" button (switch) or two-way toggle operation with dedicated switches for the stow and deploy command are options.

Installer connections are listed in the table on the following page. Strip wires, crimp and install contacts as specified in instructions supplied with the power connector (Molex 2-pin) and the data connector (Amp 14-pin).

⚠ WARNING

Route cables clear of exhaust system, other hot areas and moving parts. Failure to do so may result in serious bodily injury and/or property damage.

Battery / Ground Connections

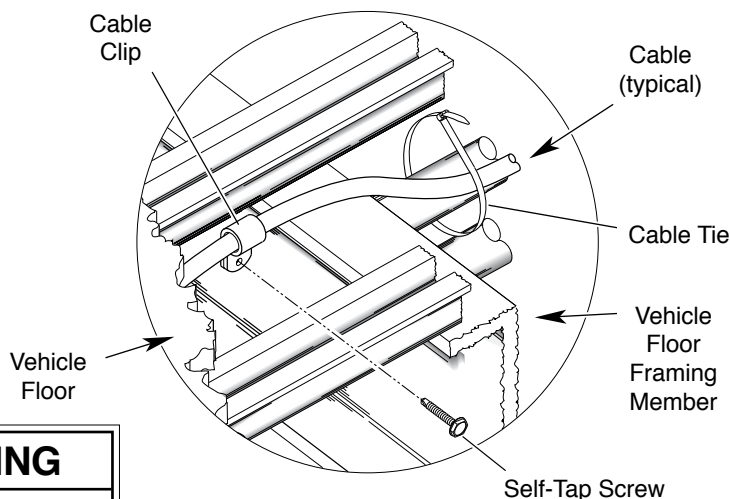
The Positive (+) "battery" lead wire **must be protected by an in-line 25 ampere fuse or circuit breaker** (installer provided).

Do not connect the power "battery" lead wire to the battery until all other connections are made.

Connect the 14-pin data harness plug to the mating connector on the controller. Connect the 2-pin Power harness plug to the mating connector on the controller.

Figure Q

Secure all cables using cable ties and/or cable clips (mount clips with self-tap screws).



⚠ WARNING



Risk of electrical shock! Use extra care when making electrical connections.

⚠ WARNING



Risk of electrical fire! Use extra care when making electrical connections.

Carefully connect the power "battery" lead wire to the Positive (+) battery post.

Chassis Ground Corrosion: When mounting chassis ground cables, remove undercoating, dirt, rust, etc. from the framing member around the mounting holes. Apply a protective coating to mounting holes to prevent corrosion. Apply grease to ground cable terminals and mounting hardware. **Failure to do so will void warranty of certain electrical components.**

RAMP INSTALLATION

Electrical Connections

The 2 pin power harness connector and the 14-pin data harness connector are supplied with the ramp.

Note: Connectors are supplied only, harnesses are supplied by ramp installer. The ramp installer is responsible for vehicle connections.

The ramp installer provides an appropriate momentary contact control switch.

Terminate the power supply, ground and ramp data signals as specified in the legends below.

The Positive (+) "battery" lead wire **must be protected by an in-line 25 ampere fuse or circuit breaker** (installer provided).

⚠ WARNING

Positive (+) battery lead wire must be protected by installer-provided 25 ampere fuse or circuit breaker. Failure to do so may result in serious bodily injury and/or property damage.

Power Harness with Molex 42816-0212 Connector (installer provided)

Function	Pin No.	Description	Wire Size
Input	1	Battery - 24 Volt with 25 Amp. Protection Device	10 Gauge
Input	2	Ground - Battery	10 Gauge

Wire Maximum Length: 10 Meters

Data Harness with AMP 206044-1 Connector (installer provided)

Function	Pin No.	Description	Wire Size
Output	1	Indicator - Move Out - Normally Open (N.O.)	14 to 18 Gauge
Output	2	Indicator - Alarm - Normally Open (N.O.)	14 to 18 Gauge
Input	3	Switch - Ramp Deploy	14 to 18 Gauge
Input	4	Switch - One Touch	14 to 18 Gauge
Input	5	Indicator - Power Common Fused	14 to 18 Gauge
Output	6	Indicator - Manual Release - Normally Open (N.O.)	14 to 18 Gauge
Input	7	Ramp Enable	14 to 18 Gauge
Output	8	Switch - Common	14 to 18 Gauge
Output	9	Indicator - Full In - Normally Open (N.O.)	14 to 18 Gauge
Input	10	Switch - Ramp Stow	14 to 18 Gauge
Input	11	Switch - Park Brake (LOW) to Operate	14 to 18 Gauge
Output	12	Indicator - Move In - Normally Open (N.O.)	14 to 18 Gauge
Output	13	Indicator - Full Out - Normally Open (N.O.)	14 to 18 Gauge
Input	14	Switch - Park Brake (HIGH) to Operate	14 to 18 Gauge

Notes: Either the One touch switch or both the Deploy and Stow switch connections should be utilized but not both.

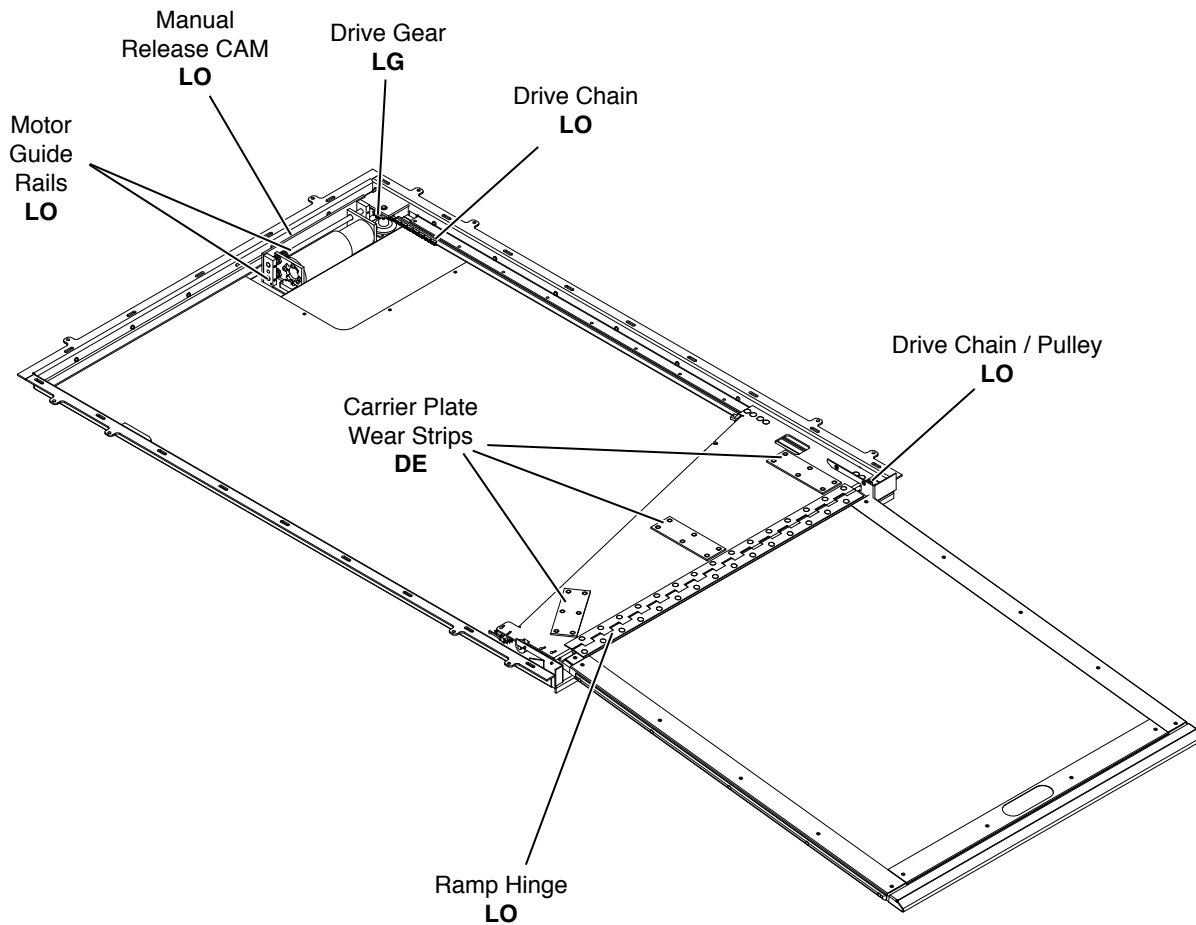
The Park Brake switch (either high or low) and Ramp Enable are required for ramp to operate. Ramp Enable requires + Vehicle power to operate.

See metric to US wire size conversion chart on page 43.

MAINTENANCE and LUBRICATION

Lubrication Diagram

See the Maintenance/Lubrication Schedule for recommended applications per number of cycles or elapsed time.



Lubricant	Type	Specified (recommended) Lubricant	Available Amount	Braun Part No.
LO - Light Oil	Light Penetrating Oil (30 weight or equivalent)	LPS2, General Purpose Penetrating Oil	11 oz. Aerosol Can	15807
DE - Door-Ease	Stainless Stick Style (tube)	Door-Ease Stick (tube)	1.68 oz.	15806
LG - Light Grease	Light Grease (Multipurpose)	Lubricate	14 oz. Can	15805

Maintenance and Lubrication Introduction

Proper maintenance is necessary to ensure safe, trouble-free operation. Inspecting the ramp for any wear, damage or other abnormal conditions should be a part of all transit agencies daily service program (preventive maintenance). Simple inspections can detect potential problems.

A generic **Daily Preventive Maintenance Schedule** is provided in this manual for transit agency use. The form can be tailored to your particular application. Preventive maintenance visual inspections **do not** take the place of the procedures specified in this schedule.

The maintenance and lubrication procedures specified in this schedule **must** be performed by a Braun authorized service representative at the scheduled intervals according to the number of cycles or elapsed time, whichever comes first.

RA500 ramps are equipped with hardened pins and self-lubricating bearings to decrease wear, provide smooth operation and extend the service life of the ramp.

Clean the components and the surrounding area **before applying lubricants**. LPS2 General Purpose Penetrating Oil is recommended where Light Oil is called out. Use of improper lubricants can attract dirt or other contaminants which could result in wear or damage to the components. Ramp components exposed to contaminants when lowered to the ground may require extra attention. Specified lubricants are available from The Braun Corporation (part numbers provided on page 30).

Recommended Intervals: These intervals are a general guideline for scheduling maintenance pro-

cedures and will vary according to ramp use and conditions. Transit agencies operating vehicles equipped with ramps that are not monitored by cycles may choose to have the ramp system maintained on the same schedule as the vehicle (routine maintenance). Doing so ensures the ramp is being maintained regularly.

When servicing the ramp at the consecutive recommended intervals, inspection and lubrication procedures specified in the previous sections should be performed (repeated). **All** listed inspection, lubrication and maintenance procedures should be repeated at "8 Weeks or 200 Cycles" intervals following the scheduled "1 Year or 1250 Cycles" maintenance.

Lifts exposed to severe conditions (weather, environment, contamination, heavy usage, etc.) may require inspection and maintenance procedures to be performed more often than specified.

Discontinue ramp use immediately if maintenance and lubrication procedures are not properly performed, or if there is any sign of wear, damage or improper operation. Contact your sales representative or call The Braun Corporation at 1-800-THE LIFT®. One of our national Product Support representatives will direct you to an authorized service technician who will inspect your ramp.

⚠ WARNING

Maintenance and lubrication procedures must be performed as specified by an authorized service technician. Failure to do so may result in serious bodily injury and/or property damage.

Maintenance and Lubrication Schedule

8 Weeks or 200 Cycles continued	Inboard ramp hinge	Clean and lubricate. Apply Light Oil - See Lubrication Diagram
	Threshold plate hinge	Clean and lubricate. Apply Light Oil - See Lubrication Diagram
	Drive chain (chain, pulleys and guides)	Apply Light Oil - See Lubrication Diagram
	Manual release (cable and mechanism)	Apply Light Oil - See Lubrication Diagram

MAINTENANCE and LUBRICATION

Maintenance and Lubrication Schedule (continued)

continued	<div>Carrier plate wear strips</div> <div>Clean and lubricate. Apply Door-Ease</div> <div>Clean ramp and ramp mounting area (ensure no debris in area to obstruct stowing)</div> <div>Clean and remove debris or obstructions</div> <div>Inspect ramp for wear, damage or any abnormal condition.</div> <div>Correct as needed</div>
8 Weeks or 200 Cycles	
1 Year or 1250 Cycles	<div>Perform all procedures listed in previous section also</div> <div>Remove motor cover and clean dirt and other foreign debris</div> <div>Blow out with air compressor</div> <div>Remove motor cover and inspect:</div> <div> <ul style="list-style-type: none"> • Harness cables, wires, terminals and connections for securement or damage </div> <div>Re secure, replace defective parts or otherwise correct as needed.</div> <div>Drive gear</div> <div>Apply Grease - See Lubrication Diagram</div> <div>Motor guide rails</div> <div>Apply Light Oil - See Lubrication Diagram</div> <div>Manual release CAM</div> <div>Apply Light Oil - See Lubrication Diagram</div> <div>Drive chain</div> <div>Apply Light Oil - See Lubrication Diagram</div> <div>Adjust chain tension</div> <div>Adjust as needed</div> <div>Inspect vehicle-to-ramp wiring harness</div> <div>Re secure, repair or replace or otherwise correct as needed</div> <div>Mounting</div> <div>Check to see that the ramp is securely anchored to the vehicle and there are no loose bolts, broken welds, or stress fractures.</div> <div>Antiskid</div> <div>Replace decals if worn, missing or illegible. Replace antiskid if worn or missing.</div>
Consecutive 8 Week or 200 Cycle Intervals	Repeat all previously listed inspection, lubrication and maintenance procedures at 8 week or 200 cycle intervals (or per vehicle maintenance schedule).

Electronic Controller

Introduction: The following procedure is for calibration of the RA500 Series Controller. **Calibrate** the controller **only if ramp does not function properly**.

Electronic Controller can be calibrated using a computer (recommended) or manually using the onboard Calibrate button and potentiometers.

Computer Calibration procedures are provided for Microsoft Windows XP. Other Operating Systems may vary. Consult the operating system search menu or users guide for alternate routes and procedures to access port settings.

Computer Calibration Instructions for Controller

Connect the Computer to the Controller:

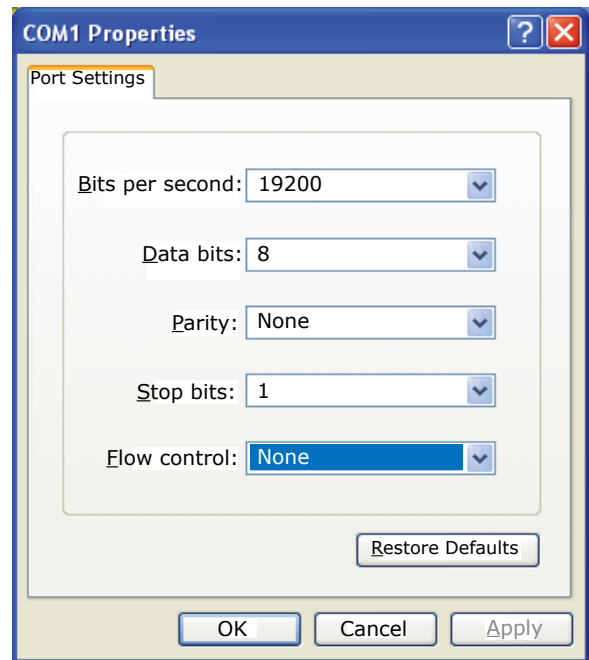
1. Remove the controller cover. Press the “Calibrate” button and then the “Calibrate Reset” button to restore factory defaults (see Figure S).
2. Locate J9 (9-pin Port) and connect a serial cable from J9 to an available COM slot on the computer.

Establish a connection between the computer and the controller:

Note: This is done from the computer after the physical connection has been made.

1. In the start menu, go to “Programs” and select “Accessories.”
2. Under “Accessories”, choose “Communications”, and then “Hyperterminal.” Once selected, a “Connection Description” window will pop up.
3. **Under name:** Enter “RA500” and hit OK. A “Connect To” window will then pop up.
4. Under the “Connect Using” line, select the com port that the serial cable is connected to (typically COM1) and hit OK.
5. A window similar to the one in Figure R will pop up. Ensure the settings match the settings listed in Figure R. Press OK.

Figure R



SYSTEMS DESCRIPTIONS

Computer Calibration Instructions for Controller (continued)

Calibrate the Controller:

Press the “Calibrate” button on the controller (see Figure S). Ensure that the Calibrate LED is red. If connected properly, a text window will pop up. The numerical values will be different, but the general format of the text window will read similar to the following:

Deploy Limit: 50

Stow Limit: 975

Adjust limits as follows:

Note: Use Limit Adjustment Chart to calculate the Deploy and Stow limit values. Three charts are provided on the right for calculation.

1. Ensure that the Calibrate LED is red.
2. Function the ramp through 4 complete deploy and stow cycles.
3. Record the Deploy Minimum and Stow Maximum values.
4. Average the Deploy Minimum and Stow Maximum values.
5. Subtract 10 from the Average Deploy Minimum value.
6. Add 10 to the Average Stow Maximum value.
7. Adjust the stow limit and the deploy limit potentiometers to show values calculated above. Values will display on computer screen as the potentiometers are adjusted.

Note: Clockwise rotation of potentiometers decreases values.

Once the limits are set, return the ramp to normal operation by pressing the “Calibrate” button a second time. Make sure that the Calibrate LED is changed to green.

Note: To reinstall factory default values, press the “Calibrate” button, followed by pressing the “Calibrate Reset” button (see Figure S).

Limit Adjustment Chart:

Operation	Deploy MIN.	Stow MAX.
Cycle 1 (C1)		
Cycle 2 (C2)		
Cycle 3 (C3)		
Cycle 4 (C4)		
Total (C1+C2+C3+C4)		
Average (Total / 4)		
Deploy Limit (Avg. - 10)		N/A
Stow Limit (Avg. + 10)	N/A	

Operation	Deploy MIN.	Stow MAX.
Cycle 1 (C1)		
Cycle 2 (C2)		
Cycle 3 (C3)		
Cycle 4 (C4)		
Total (C1+C2+C3+C4)		
Average (Total / 4)		
Deploy Limit (Avg. - 10)		N/A
Stow Limit (Avg. + 10)	N/A	

Operation	Deploy MIN.	Stow MAX.
Cycle 1 (C1)		
Cycle 2 (C2)		
Cycle 3 (C3)		
Cycle 4 (C4)		
Total (C1+C2+C3+C4)		
Average (Total / 4)		
Deploy Limit (Avg. - 10)		N/A
Stow Limit (Avg. + 10)	N/A	

Manual Calibration Instructions for Controller

Press the “Calibrate” button. Once pressed, the calibrate LED should turn on.

Adjust the Deploy Limit potentiometer to the obstruction sensing level desired (see Figure S). Rotating the potentiometer counterclockwise increases the force that the ramp will exert when it is deploying.

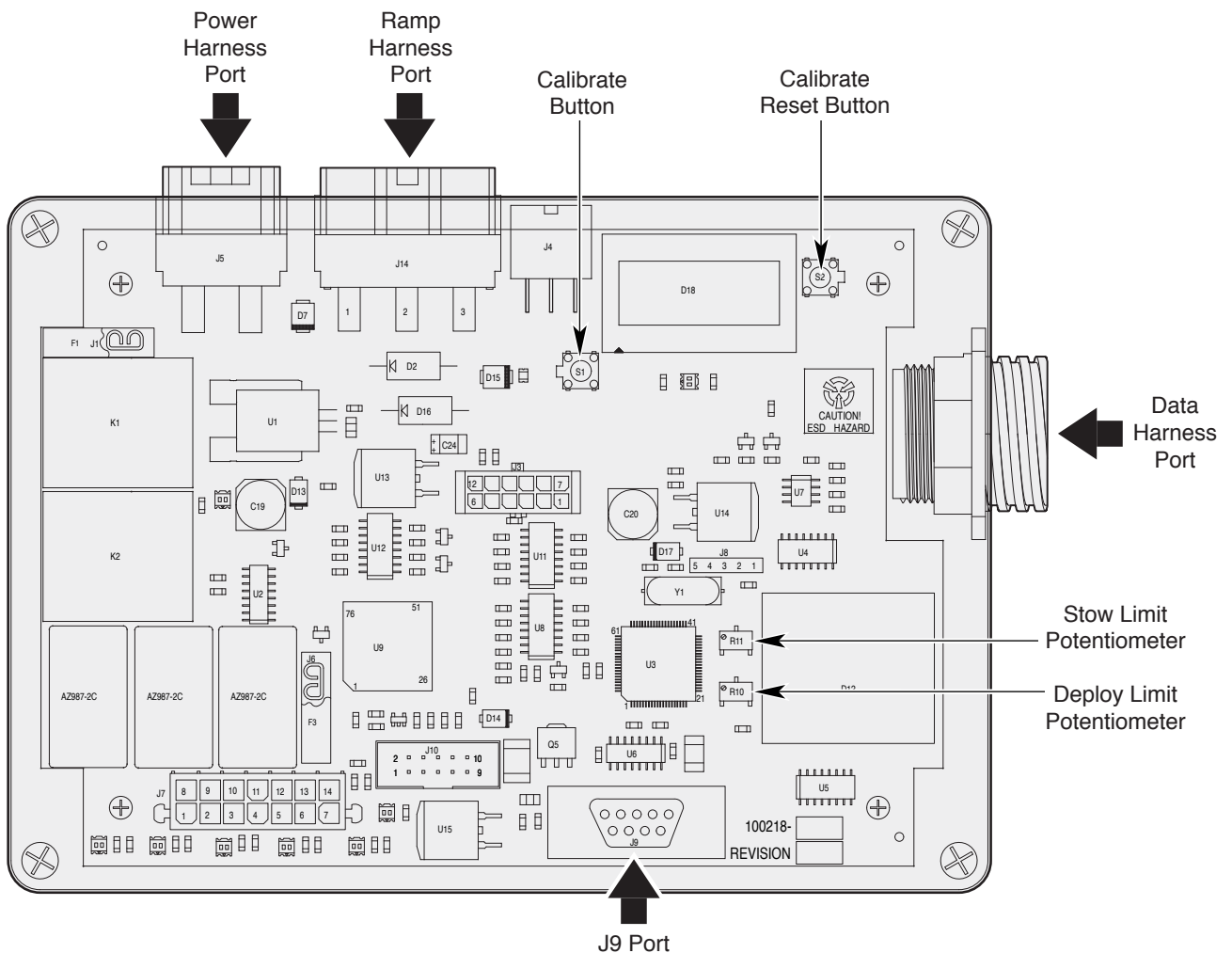
Caution: Ensure that the force exerted is not excessive. It is recommended to adjust the potentiometer in small amounts and check operation after each adjustment.

Adjust the Stow Limit potentiometer to the obstruction sensing level desired. Rotating the potentiometer counterclockwise increases the force that the ramp will exert when it is stowing.

Caution: Ensure that the force exerted is not excessive. It is recommended to adjust the potentiometer in small amounts and check operation after each adjustment.

Once the desired force levels are reached, press the “Calibrate” button a second time to store the settings. Ensure the calibrate LED is off before returning the ramp to service.

Figure S



SYSTEMS DESCRIPTIONS

Electrical

⚠ WARNING

Improper microswitch adjustment may result in serious bodily injury and/or property damage.

Microswitches: Three microswitches (limit switches) are incorporated in the RA500 electrical system (IN-Limit, OUT-Limit and Manual Release signal). Details and illustrations of the microswitches are provided. Adjust microswitch (es) as detailed.

Note: Under normal circumstances the RA500 microswitches should not need adjustment. If adjustment or replacement is required, follow the procedures provide on the next page.

Microswitch Sequence

Stowed Position: When the ramp is in the stowed position, the IN-Limit microswitch is activated (common and normally open terminals have continuity). In contrast, the OUT-Limit microswitch is deactivated.

Deploy Sequence: When the ramp is in the stowed position, the OUT-Limit microswitch is deactivated, and thus allows current to pass from the vehicle's Deploy switch circuit and energize the ramp's Bidirectional motor in the deploy direction (motor drives chains to deploy ramp).

Deployed Position: When the ramp is in the deployed position, the OUT-Limit microswitch is activated. In contrast, the IN-Limit microswitch is deactivated.

Stow Sequence: When the ramp is in the deployed position, the IN-Limit microswitch is deactivated, allowing current to pass from the vehicle's Stow switch circuit and energize the ramp's Bidirectional motor in the stow direction (motor drives chains to stow ramp).

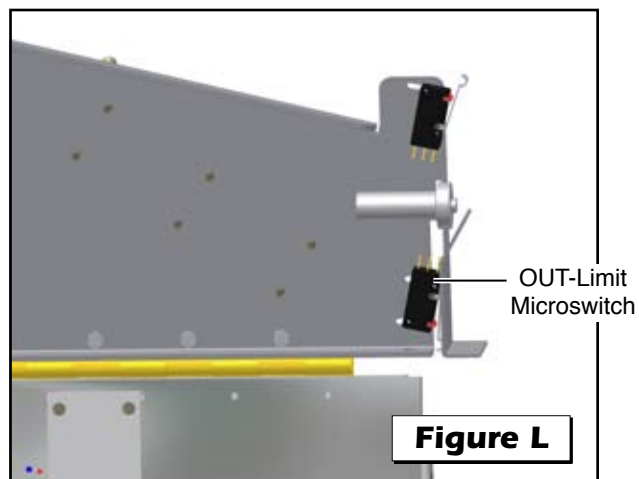
Manual Release State: When the ramp's manual release is engaged the manual release microswitch signals the controller that the manual release state of the ramp has been engaged. This signals the controller to disable the power functions of the RA500.

OUT-Limit Microswitch

The OUT-Limit microswitch is located in the out-board mounting position of the platform carrier plate.

To adjust:

1. Power or manually move the ramp to the full out position.
2. With the ramp in the deployed position loosen the OUT-Limit microswitch mounting screws.
3. Slide the switch body outward until resistance is felt from the switch being fully depressed.
4. Tighten the mounting screws in this position.



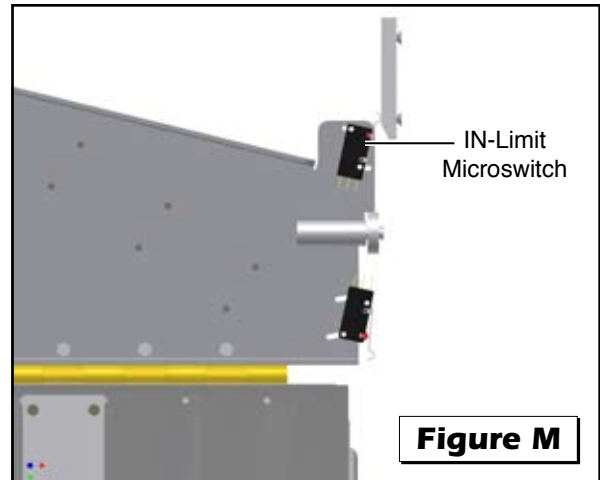
Ramp in **Full-Out** Position
(As viewed from under the carrier plate)

IN-Limit Microswitch

The IN-Limit microswitch is located in the inboard mounting position of the platform carrier plate.

To adjust:

1. Power or manually move the ramp to the fully stowed position.
2. Remove the ramp top plate (cover).
3. With the ramp in the stowed position loosen the IN-Limit microswitch mounting screws.
4. Slide the switch body outward until resistance is felt from the switch being fully depressed.
5. Tighten the mounting screws in this position.
6. Replace the ramp top plate (cover), before operating the ramp.



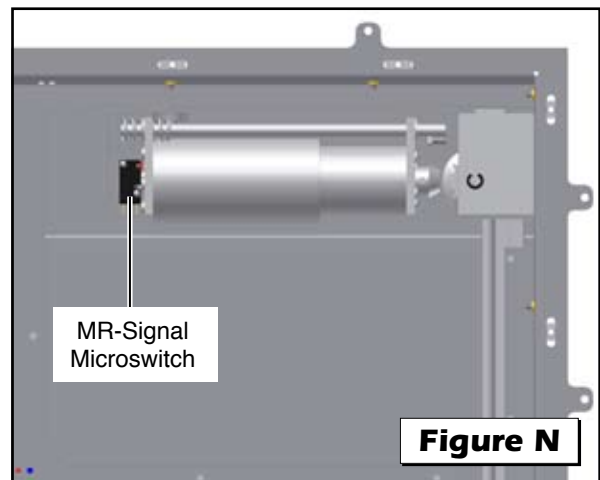
Ramp in **Fully-Stowed** Position
(As viewed from under the carrier plate)

Manual Release Signal Microswitch

The MR-Signal microswitch is located behind the electric motor mounting plate.

To adjust:

1. Power or manually move the ramp to the fully stowed position.
2. Remove the ramp top plate (cover).
3. Disengage the manual release T-handle to so the ramp is in the manual release state.
4. Loosen the MR-Signal microswitch mounting screws.
5. Slide the switch body toward the motor mounting plate until resistance is felt from the switch being fully depressed.
6. Tighten the mounting screws in this position.
7. Re-engage the manual release T-handle.
8. Replace the ramps top plate (cover), before operating the ramp.



Ramp in **Fully-Stowed** Position

TROUBLESHOOTING

Troubleshooting Diagnosis Chart

WARNING

Troubleshooting and repair procedures must be performed as specified by an authorized service technician only. Failure to do so may result in serious bodily injury and/or property damage.

If a problem occurs with your ramp, **discontinue operation immediately!** Contact your sales representative or call The Braun Corporation at 1-800-THE LIFT®. One of our national Product Support representatives will direct you to an authorized service technician who will inspect your ramp.

The cause of the problem can be determined by locating the lift function and related symptom in the Troubleshooting Diagnosis

Chart. The specific cause and remedy can then be determined by process of elimination. A Wiring Diagram and Electrical Schematic are provided to aid in troubleshooting.

A Repair Parts section with an exploded view and corresponding parts list is also provided. Correct the problem if possible. If the problem continues, contact The Braun Corporation.

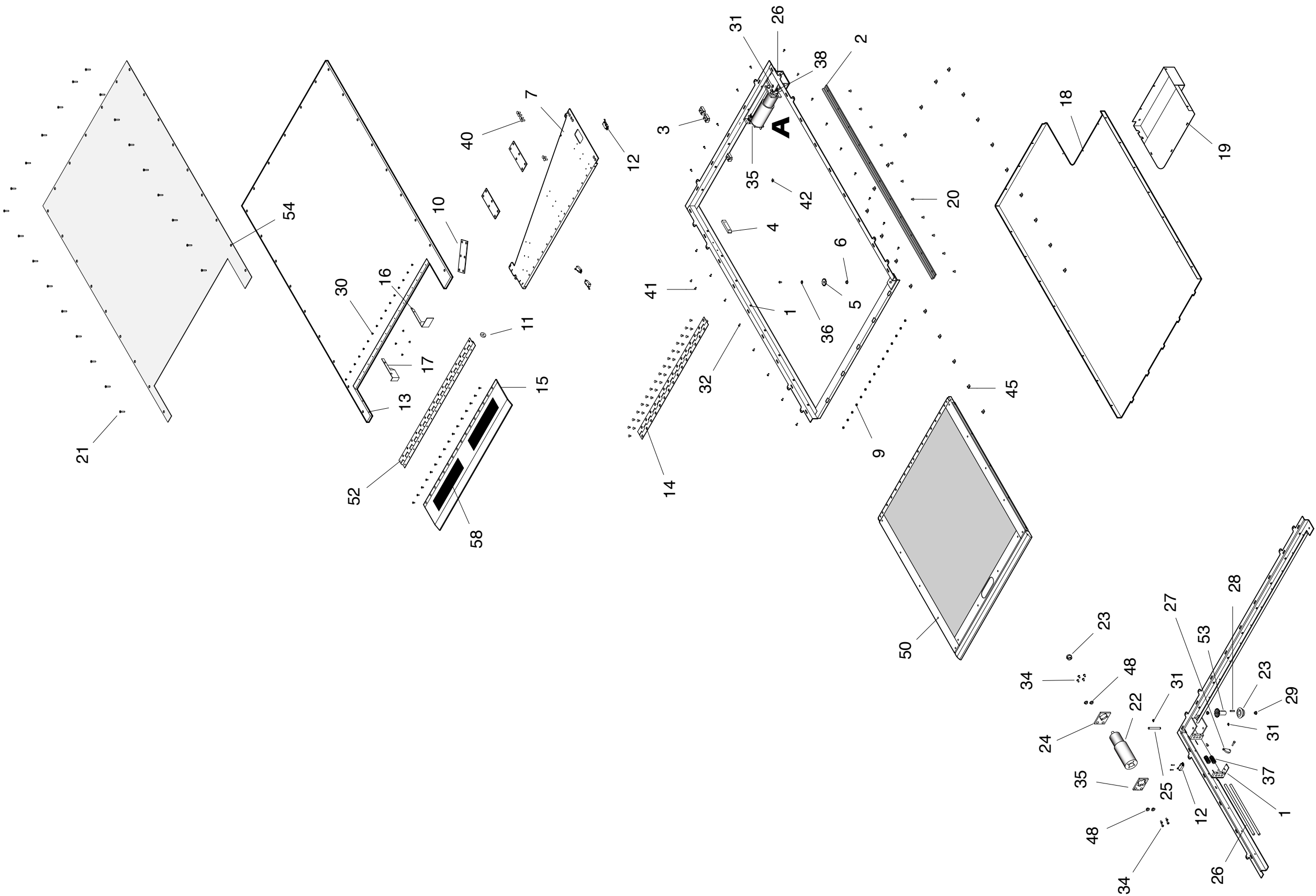
FUNCTION	SYMPTOM	POSSIBLE CAUSE	REMEDY
1.00 NO OPERATION	1.10 No Power To Controller	1.11 Battery terminals dirty 1.12 Bad chassis ground 1.13 Battery defective 1.14 Battery discharged 1.15 25 ampere in-line fuse faulty 1.16 Power cable 1.17 Vehicle Interlock(s) circuit incomplete 1.18 Vehicle-to-controller power harness	Clean and tighten Clean and tighten. See Chassis Ground Corrosion on page 28. Replace Charge battery Replace controller fuse or vehicle fuse Check for loose terminals or broken wire Correct or replace Disconnect harness from controller. Using volt meter test for proper voltage: Pin 1 = + 12/24 V Pin 2 = - Ground
	1.20 Power to Controller But No Function	1.21 Ramp to controller wiring harness 1.22 Vehicle to controller data harness 1.23 Faulty Controller 1.24 Ramp enable circuit incomplete 1.25 Parking brake interlock inactive 1.26 Manual release disengaged	Check harness for loose or broken connections. Check harness for loose or broken connections. See Controller Diagnostic Guide Correct or replace Correct or replace Check that manual release is re-engaged

FUNCTION	SYMPTOM	POSSIBLE CAUSE	REMEDY
2.00 DEPLOY OPERATION	2.10 Ramp Starts to Deploy then Stops	2.11 Pressure mat activated 2.12 Obstruction sensing activated	Remove object from mat. See controller diagnostic guide Check ramp for obstructions. Check ramp for excessive debris contamination inside cassette
	2.20 Ratcheting Noise at End or during Ramp Deployment	2.21 Ramp OUT-Limit microswitch is out of adjustment or defective	Check adjustment or replace
	2.30 Excessive Noise during Ramp Deployment	2.31 Loose chain 2.32 Debris inside ramp cassette	Adjust chain Clean debris from cassette
3.00 STOW OPERATION	3.10 Ramp Starts to Stow then Stops	3.11 Pressure mat activated 3.12 Obstruction sensing activated	Remove object from mat. See controller diagnostic guide Check ramp for obstructions. Check ramp for excessive debris contamination inside cassette
	3.20 Ratcheting Noise at End or during Ramp Stowing	3.21 Ramp full in limit switch defective	Check adjustment or replace
	3.30 Excessive Noise while Ramp Stowing	3.31 Lose chain 3.32 Debris inside ramp cassette	Adjust chain Clean debris from cassette

REPAIR PARTS

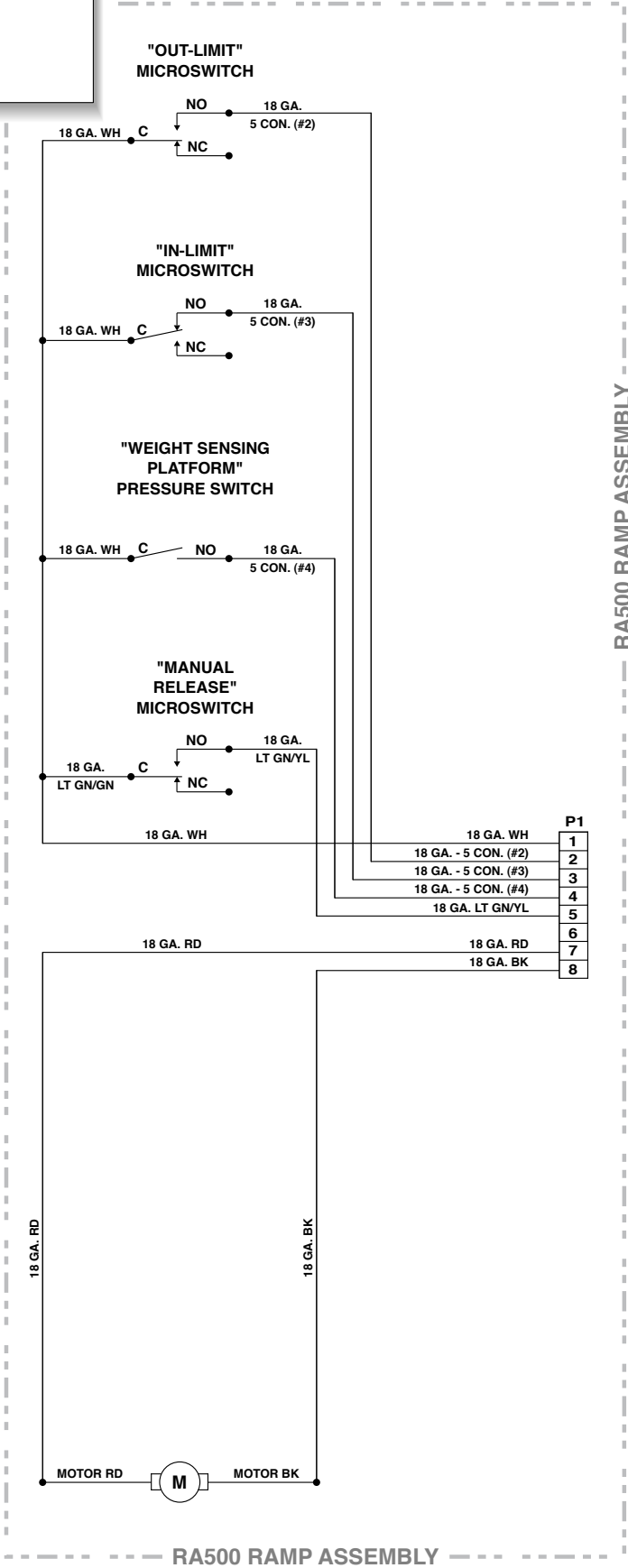
Item	Qty.	Description	RA500-3236
1	1	Weldment, Ramp Frame - RA500	RA0111W
2	1	Linear Guide System - Rail MOD	RA0020M
3	3	Linear Guide System - Carriage	RA0021
4	1	Switch, Rear Stop - RA500	RA0022
5	1	Sprocket, Fixed Guide - Manual Release - ER01	27491
6	1	Bearing, Plain Plastic - ID 8MM / OD 10MM - ER	27497
7	1	Weldment, Traveling Cross Arm - RA500	RA0112W
8	1	Weldment, Chain End - RA500	RA0024W
9	17	Nut, M5 Nylock ZP	83038
10	3	Skid Pad, RA500	RA0026
11	1	Roller, Carriage - RA500	RA0028
12	3	Microswitch, Sealed	30205
13	1	Top Plate, Alum w/ or w/o Laminate	RA0123
14	1	Hinge, SS 2" x 1/4" x 30" or 40"	18619R030
15	1	Threshold, RA500	RA0122Y
16	1	Track Cover, Left - RA500	RA0031Y
17	1	Track Cover, Right - RA500	RA0032Y
18	1	Bottom Panel - RA500	RA0124
19	1	Access Panel - RA500	RA0034
20	41	Screw, M5 x 10 Flat Socket Head Cap - SS	27448
21	23	Screw, M5 x 23 Flat Socket Head Cap - SS	27453
22	1	Motor, GR63 x 55 w/PLG52 28:1RDU - 24V	RA0080A
23	1	Miter Gear Set, 1.5M 16/32 Tooth - Bev Gear	RA0081M
24	1	Motor Support - RA500	RA0083
25	1	Pivot Pin - RA500	RA0084
26	2	Stainless Rod, 3/8" Dia. #303 x 12.5" or 13"	80379R012.5
27	1	Release Cam - RA500	RA0090
28	1	Steel Bar - 3/16" Sq. x 7/8"	21118R000.875
29	2	Bearing, Flange - 8MM x 7.7MM	32400
30	20	Screw, M4 x 6 - FHSCS/SS	32399
31	2	E Clip, 5/16" Shaft - 1/4" Groove	84086
32	22	Screw, M4 x 10 - BHSCS/SS	30153
33	-	-	-
34	9	Screw, M5 x 10 Button Head Socket Cap - SS	28786
35	1	Motor Mount - RA500	RA0089
36	1	Washer, .328" x .562" x .042" - SS	83583
37	2	Spring, 0.72" OD / .096" WD / 1.5L / Compr - SS	RA0014
38	3	Screw, M5 x 5MM Set	18321
39 *	18	Rivet, M4 x 10 Countersunk Blind	27441
40	6	Screw, M6 x 16 Flat Head Socket Cap - SS	27758
41	18	Screw, M4 x 10 Flat Head Socket Cap - SS	27440
42	4	Screw, M3 x 10 Flat Head Socket Cap - SS	27438
43 *	2	Plate, Tapped #4-40 Microswitch	24998
44 *	6	Screw, Mach. #4-40 x 5/8" Rd Hd - Auto BK	14810
45	23	Nut, Weld - M5 Plain Slab Base	32402
46 *	1	Screw, M5 x 20 Hex Head Cap - SS	27452
47 *	1	Chain, Roller 8MM Pitch - Procoat x 99"	28532R099
48	4	Bearing, Plastic - Flange 3/8" ID x 1/4"	24028
49 *	1	Cable, Manual Release - M8 x 1450 x79-ER0	27526
50	1	Assembly, Platform - Weight Sensing - RA323	RA0110A
51 *	4	Tape, Adhesive - UHMW Film - .020" x 3" - Blk	28475R
52	1	Weldment, Hinge 2" x 1/4" x 32" or 41" - SS	18619W032Y
53	1	Weldment, Sprocket - Drive Position - Carriage	RA0126W
54	1	Top Cover, Mat	RA0131
55 *	2	Link, Chain Master - 8mm Pitch - SS	27428
56 *	1	Harness, Ramp	RA0060A
57 *	1	Assembly, RA500 Interface Board	100218-001
58	2	Grip Tape, Traction Adhesive 3" x 12" - Yellow or Black	24173-YL
59 *	1	Harness, Ramp Controller	RA0128A
60 *	2	Tag, Serial # / Series # - Plastic	18548P
61 *	1	Assembly, Platform - Weight Sensitive	RA0110A
62 *	1	Assembly, Controller RA500 Interface Board	100218-001

*Item not Shown



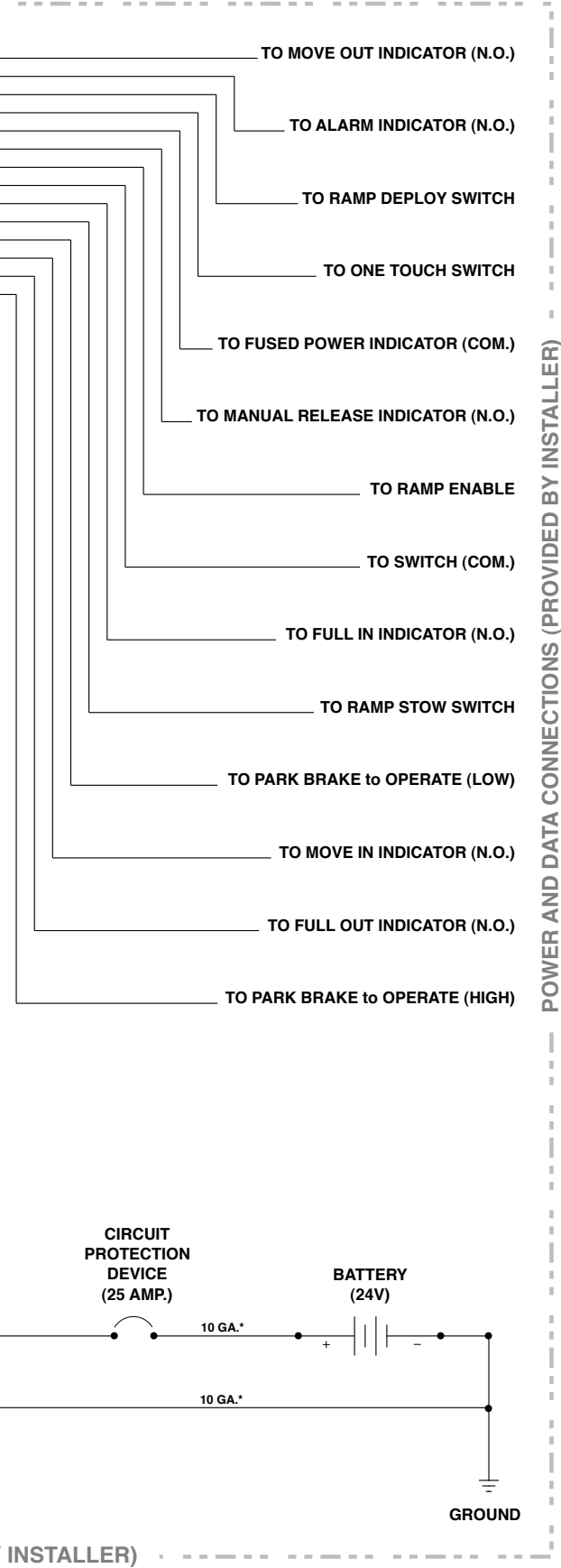
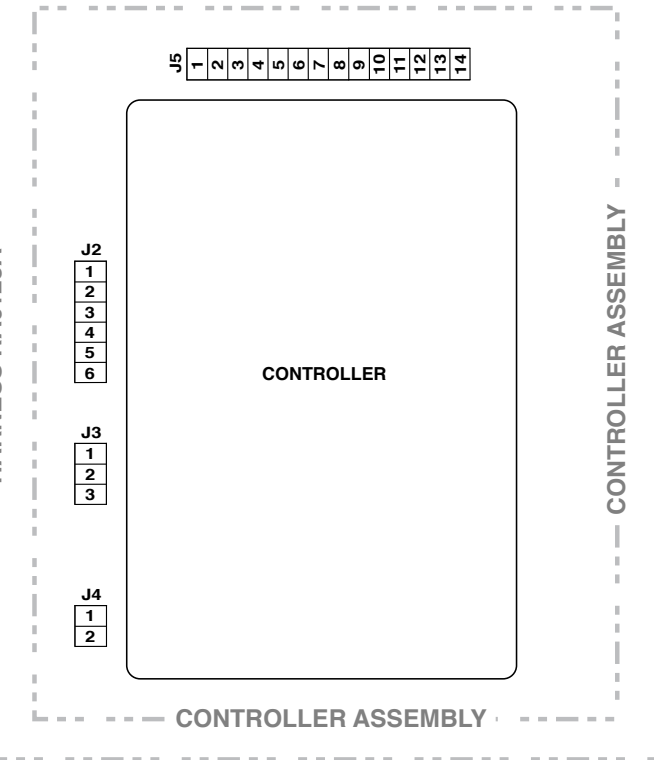
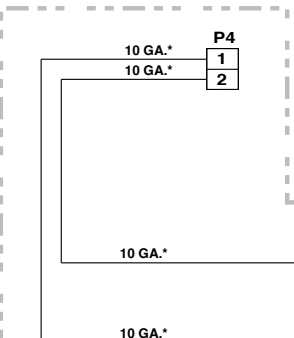
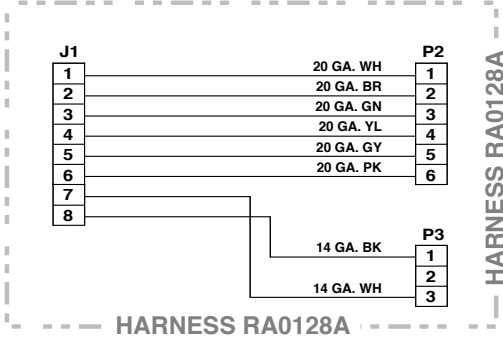
DETAIL A
Rotated 90°

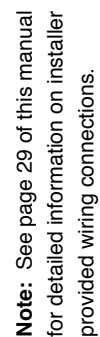
WIRING SCHEMATIC



SYMBOL KEY	
DESCRIPTION	SYMBOL
BATTERY	
CHASSIS GROUND	
CIRCUIT PROTECTION DEVICE	
JUNCTION	
MICROSWITCH	
MOTOR	

- NOTES:
- 1) DRAWING SHOWN WITH RAMP IN STOWED POSITION.
 - 2) CROSSING INTERSECTIONS ARE NOT CONNECTIONS (JUNCTION), UNLESS MARKED AS JUNCTION.
 - 3) * RECOMMENDED WIRE GAUGE.





DAILY PREVENTIVE MAINTENANCE SCHEDULE

Vehicle Number: _____

Date: _____

Inspector: _____

Pre-Trip Inspection:

Before each scheduled day of lift service, operate ramp **minimum one complete cycle** and inspect each of the following :

- ☒ Do the vehicle interlock(s) function as intended?
- ☐ Does the ramp deploy when the ramp interlock is activated as intended?
- ☐ Does the control switch(es) function properly?
- ☐ Does the ramp cargo door light (if equipped) function as intended?
- ☐ Do the lift cargo door securement devices function as intended (if equipped)?
- ☐ Does the ramp safely clear the cargo door as the ramp is deployed and stowed?
- ☐ Does the ramp operate smoothly (no jerking or abnormal movement)?
- ☐ Does the ramp operate at normal speed?
- ☐ Is the power source adequate?
- ☐ Is ramp operation quiet (no rattles, abnormal sounds, etc.)?
- ☐ Is the ramp antiskid in place, worn or damaged?
- ☐ Can you visually detect any ramp wear, damage, misalignment, loose bolts, broken welds or any abnormal conditions?

Post-Trip Inspection:

Operate ramp **minimum one complete cycle** and check each of the above daily pre-trip inspections **if applicable** for your daily inspection routine (outlined by your transit agency).

- ☐ Clean ramp surfaces where wheelchairs travel
- ☐ Clean and lubricate key locations based on ramp usage frequency and climate conditions (outlined by your transit agency). Lubrication procedures should be performed by a Braun authorized service representative as detailed in this manual.

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Braun Commercial RA500 Transit Ramp

Braun "Worry-Free" Limited Warranty

The Braun Corporation ("Braun") warrants its ramp against defects in material and workmanship for three years, provided the ramp is installed, operated and maintained in conformity with this manual. Warranted replacement parts are covered until the expiration of the Braun warranty or 90 days, whichever is longer. The Braun warranty covers the cost of labor for any repair or replacement covered under the warranty during the first year of the warranty period, if an approved Braun dealer completes the warranty work.

The warranty registration card accompanying this ramp is to be completed and returned to The Braun Corporation within 20 days of purchase. If Braun receives the warranty card, the warranty period begins on the day the ramp is put into service. If Braun does not receive the warranty card, the parts warranty will expire in three years, and the labor warranty will expire in one year from the manufacture date of the ramp.

The Braun warranty does not cover any defects in the motor vehicle on which the ramp is installed, or defects in the ramp caused by any defect in the motor vehicle. The warranty does not cover work deemed by Braun to be normal maintenance, service, or periodic adjustments necessitated by use or wear. The Braun warranty is null and void if any repair or maintenance work is completed during the warranty period using parts not authorized by Braun or if, as determined solely by Braun, the ramp is damaged through accident, misuse or abuse, or altered in any way.

THIS WARRANTY IS IN LIEU OF ALL IMPLIED WARRANTIES, INCLUDING WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, PERFORMANCE, OR OTHERWISE, WHICH ARE HEREBY EXCLUDED. IN NO EVENT SHALL BRAUN BE LIABLE FOR ANY DAMAGES, WHETHER DIRECT, IMMEDIATE, INCIDENTAL, FORESEEABLE, CONSEQUENTIAL, OR SPECIAL, ARISING OUT OF OR IN CONNECTION WITH ITS PRODUCT.

To contact Braun or to obtain a list of Braun authorized dealers, call 1-800-THE-LIFT or visit our web site at www.braunlift.com.

The Braun Corporation
Winamac, Indiana

Return Authorization Procedure

When processing any warranty claims (parts, repairs, etc.), all requests must be processed through The Braun Corporation Product Support Department. Call 1-800-THE LIFT during normal working hours. Product Support will issue a Return Material Authorization (RMA) number and detail the procedures required for processing returns and/or authorizing credit.

The lift identification information is provided on the Braun Serial No./Series No. identification tag and the two warranty cards (shown on inside front cover). The lift identification information must be provided when filing a warranty claim or ordering parts.



32848 Rev. A
August 2006

All illustrations, descriptions and specifications in this manual are based on the latest product information available at the time of publication. The Braun Corporation reserves the right to make changes at any time without notice.

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